**US Army Corps
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Waterways Experiment
Station

Index and Bulk Parameters for Frequency-Direction Spectra Measured at CHL Field Research Facility, September 1995 to August 1996

by   *Charles E. Long*

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Waterways Experiment Station
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Final report

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US Army Corps of Engineers
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STRUCTURES LABORATORY

SCALE

500   0   500 m

AREA OF RESERVATION < 2.7 sq km

Contents

Preface

This report indexes parameters of and describes means of access to a series of wind wave frequency-direction spectral observations made with a 15-element, high-resolution directional wave gauge at the Field Research Facility (FRF) of the U.S. Army Engineer Waterways Experiment Station (WES). The work was motivated by a paucity of observations of directionally distributed wave energy, which has hindered understanding and modeling of the nearshore processes that affect coastal engineering projects. This effort was authorized by Headquarters, U.S. Army Corps of Engineers (HQUSACE), under Civil Works Coastal Navigation Hydrodynamics Program Research Work Unit 32484, "Directionality of Waves in Shallow Water." Funds were provided through the Coastal and Hydraulics Laboratory (CHL), WES, under the program management of Ms. Carolyn M. Holmes, CHL. Messrs. John H. Lockhart, Jr., Charles Chesnutt, and Barry W. Holliday were HQUSACE Technical Monitors.

This summary report was prepared by Dr. Charles E. Long, under the direct supervision of Mr. William A. Birkemeier, Chief, FRF, and Mr. Thomas W. Richardson, Chief, Engineering Development Division, CHL. The work was performed under the general supervision of Dr. James R. Houston and Mr. Charles C. Calhoun, Jr., Director and Assistant Director, CHL, respectively.

The directional wave gauge and its data processing software were designed by Dr. Joan M. Oltman-Shay while at Oregon State University working through an Intergovernmental Personnel Agreement. The directional wave gauge was physically maintained with diver coordination by Messrs. Michael W. Leffler and C. Ray Townsend III, FRF, and logistical support by Mr. Brian L. Scarborough, FRF. Gauge calibration was maintained by Messrs. Kent K. Hathaway and Paul R. Hodges, FRF. Acquisition, monitoring, and storage of raw data were done by Mr. Clifford F. Baron, FRF.

At the time of publication of this report, Director of WES was Dr. Robert W. Whalin. Commander was COL Bruce K. Howard, EN.

1   Introduction

Wind waves are among the dominant forcing mechanisms in all coastal processes. Estimation of wave forces for engineering design requires knowledge of sea state, which is described, at a minimum, by an amplitude, a frequency, and a direction for each component of a wave field. Historically, there have been many observations of wave amplitude and frequency, but very few detailed observations of wave direction, due primarily to additional technical requirements in making such measurements. This represents a distinct and very important void in the knowledge required for comprehensive engineering design.

To begin to alleviate this dearth of knowledge, the Field Research Facility (FRF) of the U.S. Army Engineer Waterways Experiment Station installed a high-resolution, directional wave gauge for long-term observations of the nearshore incident directional wave climate at its site near Duck, NC (Figure 1). The original gauge, consisting of an alongshore linear array of nine pressure gauges, was installed in September 1986. In September 1990, an additional six gauges with a cross-shore alignment were incorporated, making a 15-element, two-dimensional spatial array for estimating wave energy propagating in all directions.

Data thus obtained, which take the form of wave frequency-direction spectra, are intended for use by the broadest possible group of researchers and application engineers, and have been archived in a simple database. This report simplifies data dissemination by indexing and describing means of access to the set of observations collected from September 1995 to August 1996, the tenth year of deployment. Indexes for preceding years have been reported by Long (1991a, 1991b), Long and Smith (1993, 1994), Long and Atmadja (1994), Long and Pemberton (1994), Long and Roughton (1994, 1995), and Long (1996).

The main text of this document describes and clarifies the substantial information contained in the appendixes. Brief overviews are given of the measurement site, instrumentation, data collection, and method of directional spectral estimation. These subjects are described in greater detail in other publications, to which the reader is referred. Following the overviews is a description of the archived frequency-direction spectra and some characterizing bulk parameters that can be derived from them. Appendix A is a listing of these characterizing parameters and is intended to be used as a catalog of the set of spectra. Appendix B contains graphs of time series of some of these parameters as a pictorial augmentation of the information in Appendix A. Appendix C illustrates a
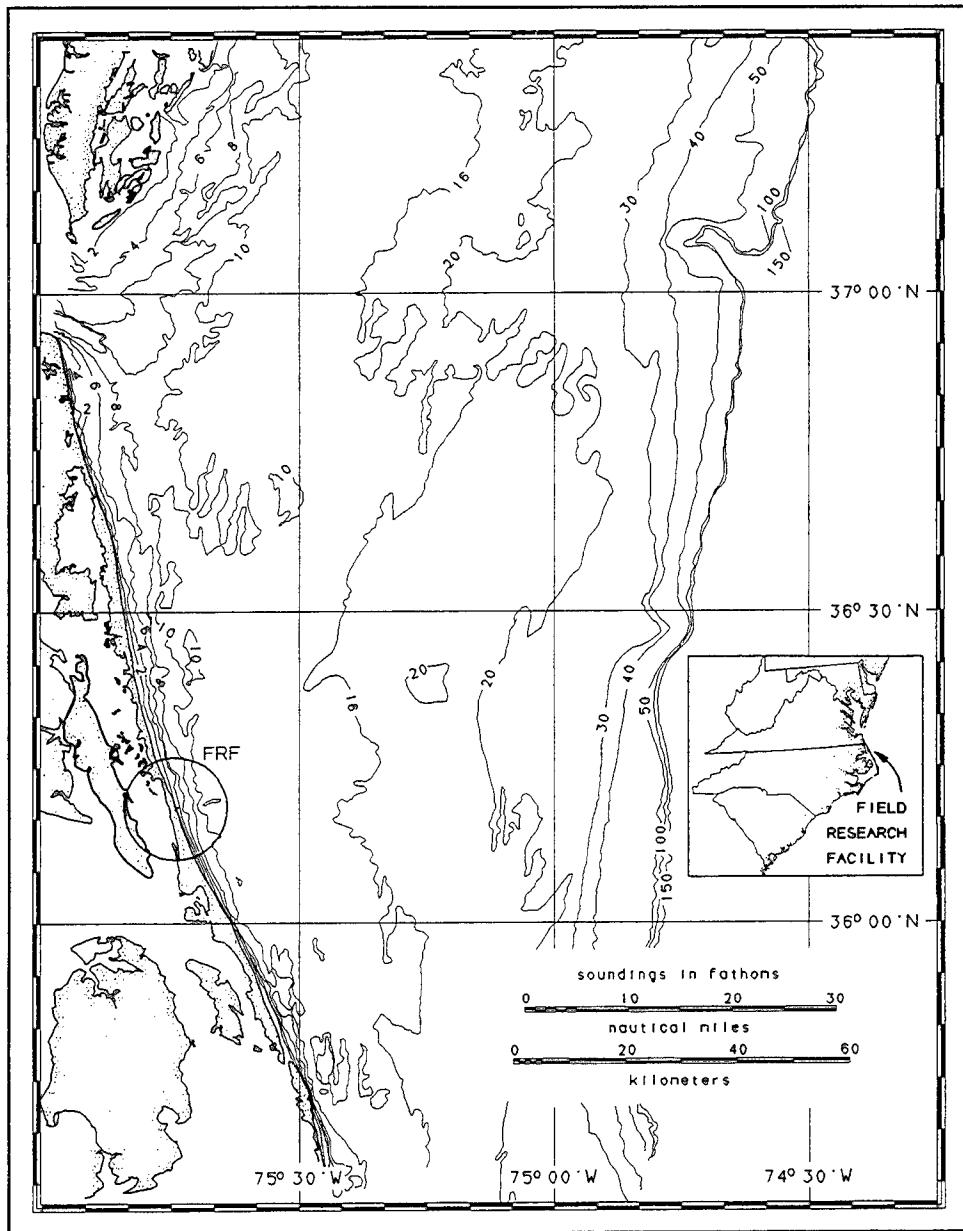
Figure 1. Location and offshore bathymetry of the FRF

FORTRAN computer program that can be used to read archived data, of which a
sample listing is given in Appendix D.

2 Field Research Facility

As shown in Figure 1, the FRF is located on the barrier island chain of coastal North Carolina. A detailed description of the layout, function, and capabilities of the FRF is given by Birkemeier et al. (1985). Of particular relevance to directional wave studies are the wave-steering bathymetry and wave-generating winds.

Bathymetry

The coastline in the vicinity of the FRF is nearly straight for several tens of kilometers north and south (Figure 1). It is oriented such that a shore-normal line (directed seaward) is very nearly 70 deg from true north. Waves and on-shore winds can approach this site along an easterly 180-deg arc from 340 to 160 deg true. The adjacent continental shelf is wide, relatively shallow, and of somewhat complex bathymetry. The direction of nearest approach of the 100-m (328-ft) isobath, which indicates the shelf break, is 10 to 15 deg south of east. On this azimuth, the shelf break is about 80 km (43 n.m.) distant. A typical bottom slope for the shelf is 0.001, but this is interrupted by numerous features of 1- to 10-km (0.5- to 5.4-n.m.) horizontal scales and 10-m (33-ft) vertical scales scattered irregularly across the shelf.

Within a few kilometers of the FRF, the offshore bathymetry is more regular, with isobaths nearly shore-parallel and a bottom slope of about 0.002 (Figure 2). Some irregularities exist. Within about 300 m (984 ft) of the shore, there exists a complex and mobile bar system (Birkemeier 1984) that is strongly influenced by nearshore waves and currents. These processes have also created some irregular bathymetry in the vicinity of the 600-m-long (1,970-ft-long) FRF research pier (Miller, Birkemeier, and DeWall 1983).

Wave-Generating Winds

The site is subject to a variety of climates, which gives rise to a diverse set of directional wave conditions. Primary sources of high-energy waves are winds associated with hurricanes and frontal passages. Though no hurricanes passed directly over the FRF during the period covered by this report, two passed near enough that significant wave energy could be measured at the FRF. These were
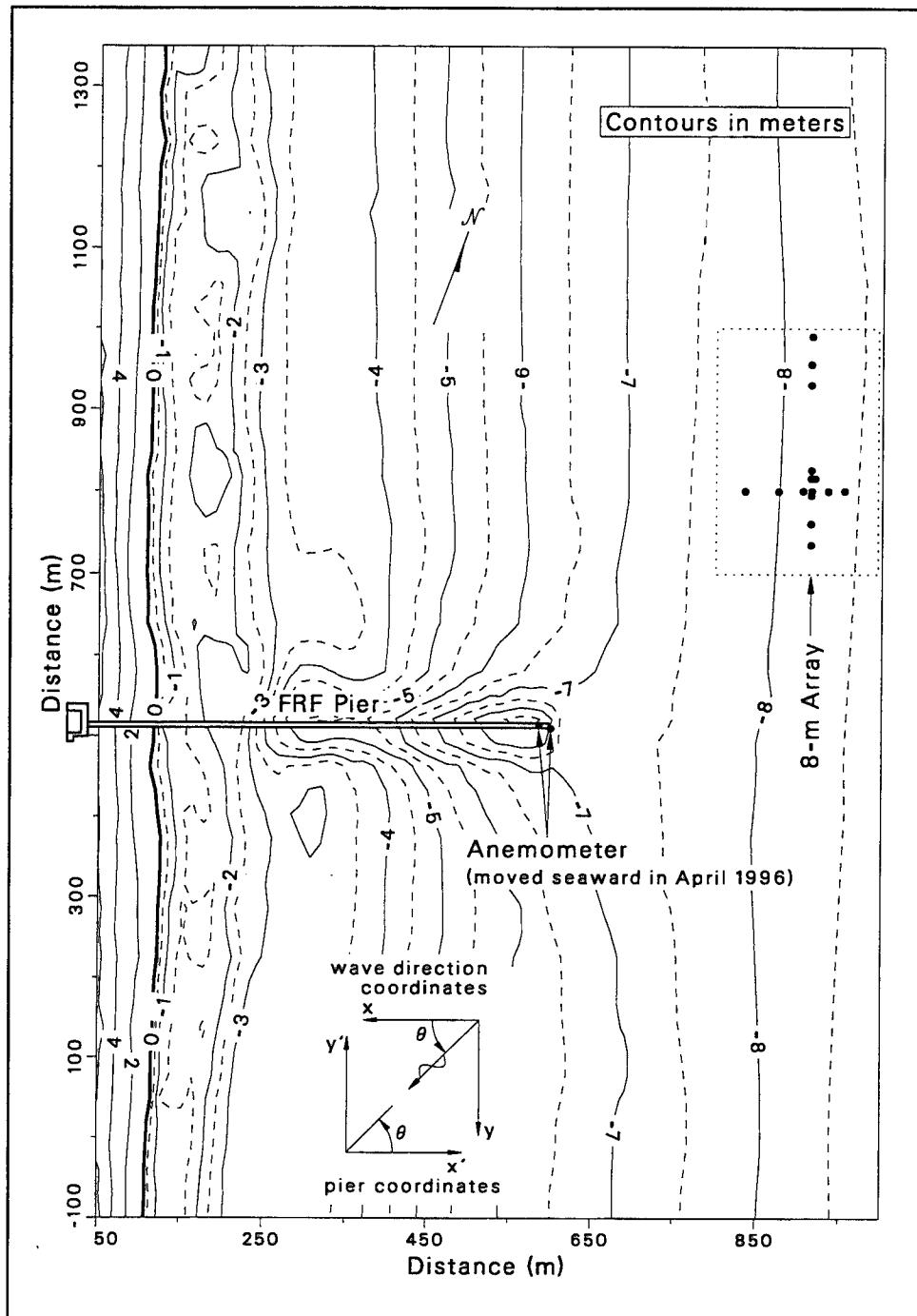
Figure 2. FRF nearshore bathymetry and coordinate system

Hurricane Edouard, 31 August-2 September 1996, and Hurricane Fran, 5-6 August 1996. Low-pressure weather fronts, of which several crossed the FRF site during this reporting period, were typically oriented northeast-southwest with strong wave-generating winds coming from the northeast.

For additional information, the National Oceanic and Atmospheric Administration daily weather maps (U.S. Department of Commerce 1995, 1996) contain

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large-scale depictions of weather systems passing the FRF site during this collection period. Detailed, quantitative descriptions of the climate at the FRF, as determined from its extensive instrumentation, are given in a series of annual reports, of which those by Leffler et al. (in preparation (a, b)) include information from the time covered by the present report.

3 Instrumentation

The primary instrument in this study is a high-resolution directional wave gauge. It consists of two parts. The first is a spatial array of sensors that sample sea-surface displacement at several points in (horizontal) space. The second, described in the following section on data processing, is the mathematical treatment of these data to obtain estimates of wave directionality.

The FRF array consists of 15 pressure gauges mounted approximately 0.5 m (1.6 ft) off the bottom in the vicinity of the 8-m (26-ft) isobath about 900 m (2,953 ft) offshore and to the north of the research pier (Figure 2). Its location satisfies three constraints. First, it is generally outside the surf zone so that linear wave theory is applicable in data processing. Second, it is in water shallow enough that signals from 3-sec waves, the shortest periods of interest here, are detectable above background noise at the bottom-mounted gauges. Third, it is located away from the irregular isobaths around the pier and in the nearshore bar system, which helps minimize bathymetrically induced inhomogeneities in the wave field.

Spacing between gauges in the array appears irregular in Figure 2 but, for the most part, corresponds to the array-design criterion posed by Davis and Regier (1977) that every gauge pair has a unique separation. Figure 3 is an enlarged view of the array layout and shows gauge spacing as well as the gauge naming scheme. The array geometry encompasses considerable ranges in both sizes and numbers of gauge separations. Minimum gauge spacing is 5 m (16.4 ft) in both the alongshore and cross-shore directions. Maximum spacing is 255 m (837 ft) in the alongshore direction and 120 m (394 ft) in the cross-shore direction. Intermediate gauge spacings are in multiples of 5 m (16.4 ft). With 15 gauges, there are 105 possible unique spacings. In the FRF array, 12 redundant spacings are intentionally left for ancillary examination of spacial homogeneity of the wave field, so that 93 unique spacings remain.

Each pressure gauge is a Senso-Metric Model SP973(C), in which a piezo-electric strain gauge detects displacement of a pressure-sensitive diaphragm referenced to an evacuated cavity. Site calibrations indicate an accuracy of the pressure equivalent of ±0.006 m (±0.02 ft) of water for wave-induced fluctuations about a static water column height of 8 m (26 ft).

Voltage analogs of pressure signals are hard-wired through 10-Hz, fourth-order, Butterworth filters (primarily to eliminate 60-Hz noise) to an analog-to-
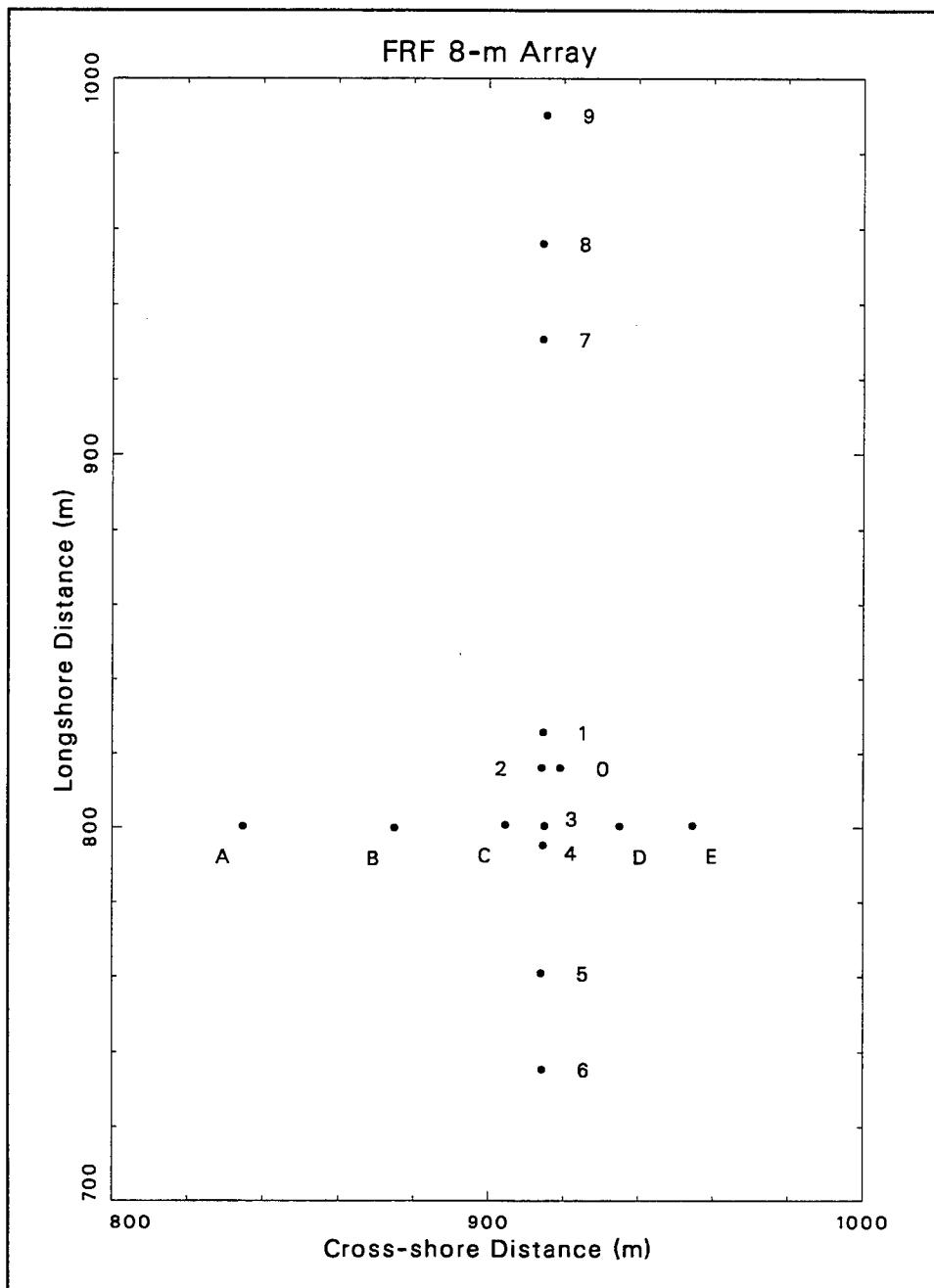
Figure 3. Spacing and numbering of linear array gauges

digital signal converter, and then to a Digital Equipment Corporation
VAXstation 4000 computer for data acquisition. Discretization of the full-scale
signal to 11-bit binary form results in a digitization step of the equivalent of
0.007 m (0.023 ft) of water, which is nearly the same as the accuracy of the
Senso-Metric gauges.

4 Data Collection

Signals from each of the pressure gauges were sampled at 2 Hz and stored digitally as records of 4,096 points (34 min 8 sec). A collection consisted of four such records, or 16,384 points (2 hr 16 min 32 sec) for each gauge. This procedure resulted in a total of 245,760 data points to produce one frequency-direction spectrum. Collections occurred eight times daily with starting times 0100, 0400, 0700, 1000, 1300, 1600, 1900, and 2200 hr Eastern Standard Time (EST). With this sampling pattern, the maximum number of collections is 2,928 in a 366-day year. Some collections are missed, however, because of necessary maintenance and repairs to the directional array and the data collection system.

During the year covered by this report, a total of 2,812 frequency-direction spectra (about 96 percent of the maximum possible) were obtained. A list of data collection start times for these observations is given in Appendix A. Appendix B contains time-series plots of spectral parameters along with available wind observations. Locations of reference anemometers are shown in Figure 2.

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5 Data Processing

Conversion of measured time series to estimates of frequency-direction spectra requires products of auto- and cross-spectral estimates from the array gauge data. For final results to be accurate, raw input data must be of exceptionally high quality so that spiky or drifty data from one gauge do not contaminate all results. Hence, the procedure for data processing is to check raw data for errors before estimating frequency-direction spectra. Once directional spectra are obtained, some bulk parameters can be computed to characterize results.

Error Checking

Because multiple gauges were deployed in what is assumed to be a uniform sea, certain statistical properties of raw data from each of the set of gauges should be identical. One such property is the frequency spectrum $S(f)$ (where f is frequency)[1] of raw (not surface-corrected) pressure signals. Under the ideal circumstances of constant water depth, uniform gauge elevation from the bottom, and no statistical noise, frequency spectra from all gauges are identical in every detail. Though these circumstances are not met exactly in the FRF system, they are approximated sufficiently closely that an intercomparison of the frequency spectra from the array of gauges is an excellent method for identifying erroneous data records.

A convenient way to effect such an intercomparison is to overplot frequency spectra from all the gauges on a single graph. Wind wave signals attenuate with depth so that, in accordance with linearized wave theory, very little direct wind wave energy is expected in the frequency range from about 0.4 Hz to the sampling Nyquist frequency (1.0 Hz for normal FRF sampling). Spectra in this frequency band should primarily indicate system noise, which should be about the same for all gauges of like kind, and consistent in time for all gauges. Excessively spiky data from one or more gauges appear as increased noise levels relative to data from normally functioning gauges. Strong low-frequency drifts in data from one gauge appear either as deviations in the low-frequency part of the spectrum, or as varying mean values from segment to segment through a data record. In the pass band of wind wave frequencies for which directional estimates are computed (0.04 to 0.32 Hz for these data), one expects the frequency

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[1] For convenience, symbols and abbreviations are listed in the notation (Appendix E).

spectra to be nearly identical. A malfunctioning gauge is clearly identifiable in this type of intercomparison.

Figure 4 is an example of one set of overplotted frequency spectra. Semilogarithmic coordinates have been used to emphasize the behavior of the low-energy, high-frequency spectral tails. All pressure gauge signals have been converted to equivalent heights of a static water column for convenience in interpretation. As can be seen in Figure 4, spectra in the wind wave frequency pass band are very nearly alike, indicating that all gauges are functioning reasonably well. The noise floor at high frequencies is very low relative to the wind wave signal and is nearly uniform for all gauges.

The inset graph in Figure 4 reveals information about gauge mean values. Data records were divided into 15 half-overlapping segments, each having a duration of 17 min 4 sec. Segment mean values were then computed for each gauge. Ideally, when gauge means are corrected for the depth of water in which they were deployed and for the elevation of the gauge from the ocean bottom, they would all give a measure of mean water level arising from tidal elevation, barometric overpressure, and any wind- or wave-induced setup. These means should be the same for all locations in the array for that segment of time. Experience has shown that the Senso-Metric gauges used in the array tend to have a modest mean drift over time scales of months. For the analysis used to produce this report, an estimate of true water depth was computed by finding the median of the set of corrected gauge means for each segment. The inset in Figure 4 shows the deviation of individual gauge means from this median value as a function of segment number, and indicates, for this example, mean depth errors ranging from about 0.5 m (1.6 ft) low to about 0.2 m (0.7 ft) high. By referencing all gauges to the median mean depth, potential errors in surface correcting the wind wave part of the signal are reduced.

The triangular symbol in the inset in Figure 4 shows the deviation of the median mean depth from still-water level (based on the 1929 National Geodetic Vertical Datum) as a function of segment number. The resulting curve represents the combined effects of tide, setup, and barometric overpressure. The square symbol in the inset of Figure 4 is the deviation of barometric pressure from one standard atmosphere (in units of meters of sea water) as a function of segment number. This curve indicates the magnitude of atmospheric pressure effect on pressure measurements of mean water level. This effect is removed from pressure gauge means by subtracting the excess of atmospheric pressure over one standard atmosphere from each of the gauge means.

It is noted that the present method of error checking is different from that used for results reported for the first four years of array analysis (Long 1991a, 1991b; Long and Smith 1993, 1994). The older method relied on moments and extremal characteristics derived from data time series in the time domain. The present method casts the data in the frequency domain, but is sensitive to the same underlying characteristics that would flag data as suspect in the older
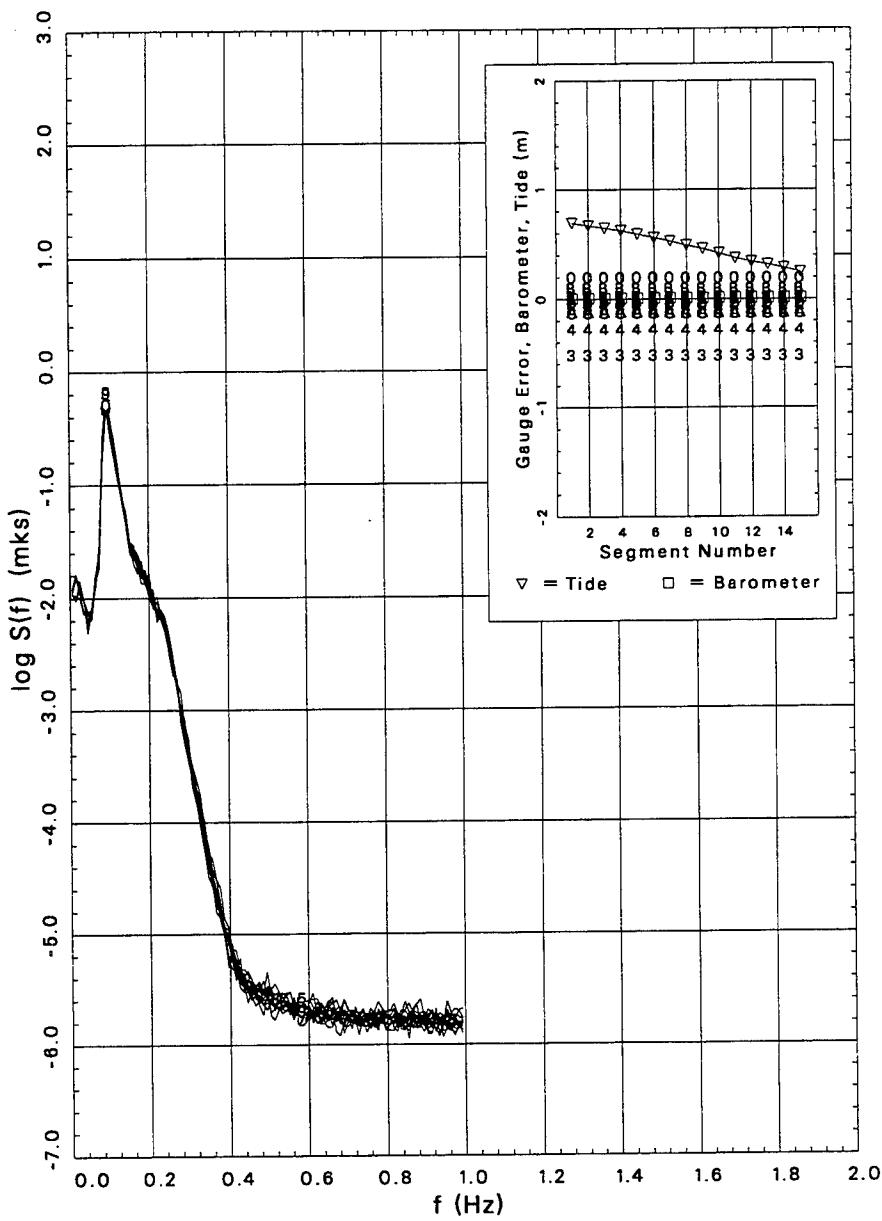
Figure 4. Example of overplotted frequency spectra

method and is much easier to use. In both methods, if a gauge demonstrated properties that deviated too much from properties of the other gauges, it was flagged as being suspect, and the data were then further examined by hand to ensure that the flagging procedure had indeed identified a malfunctioning gauge.

If a gauge malfunctioned, it was not used in further analysis. The analysis programs were written so that data from a subset of gauges could be analyzed. A few gauges could then be lost without seriously compromising the results. Using fewer gauges yields a somewhat reduced directional resolution. Some gauges are more critical than others. If any of the gauge pairs with 5-m (16.4-ft) spacings are lost, results become invalid at high frequencies due to spatial aliasing. In these cases, directional analysis was truncated at a lower high-frequency limit (generally 0.24 Hz instead of the normal 0.32 Hz). As discussed in the next section, there are additional reasons for eliminating gauges from directional wave estimation at some frequencies in a spectrum. However, fewer than four gauges are never used for any frequency.

To keep track of the set of functioning and not otherwise eliminated gauges, a parameter called the *gauge pattern* was created and stored with the results for each frequency in archived directional spectra. The gauge pattern is a 16-place character string that represents which of the possible gauges (the 15 array gauges plus one extra space) were used to compute a directional spectrum at a particular frequency. The string contains the identifying characters (based on the gauge identification scheme shown in Figure 3) of gauges that were used in analysis, followed by blank characters to fill out the string. This parameter can be of use in later analysis for assessing the directional resolving ability of a particular subarray of gauges. This definition of gauge pattern differs from that used for the first four years of archived data, but the automated analysis algorithm was modified in September 1990 to be more dynamic in gauge selection (as described in the next section), and so necessitated this change.

Frequency-Direction Spectra

Two types of spectra

Data from the array of gauges are processed as two separate entities, both of which are frequency-direction spectra, but having different properties. One of the entities is a frequency-direction spectrum using only the original nine gauges (gauges 1, 2, 3, 4, 5, 6, 7, 8, and 9 in Figure 3) of the alongshore linear array. Directional spectra from this set of gauges are referred to as *linear array* results. The other entity is a frequency-direction spectrum using all gauges. Directional spectral estimates using all gauges are called *8-m array* or *full array* results.

There are several reasons for this distinction. One is that the database for the first four years of this study is based on results from the linear array. Comparisons of results over the full duration of the study and the accumulation of climatological statistics require a continued analysis of the linear array as a unique entity. A shortcoming of the linear array is that it cannot distinguish seaward-propagating waves from incident waves. In processing linear array data, it must be assumed that all wave energy is incident, which does not allow for the possibility of reflections from the nearshore. This problem is overcome by using the full array, which includes gauges at cross-shore locations (gauges 0, A, B, C, D, and E in Figure 3) off the line of the linear array. The full array can detect wave

energy propagating in all directions and so can be used to estimate the amount of wave energy reflected (and otherwise propagating) from the nearshore.

Ideally, the full array would be adequate for all directional spectral estimates. However, the analysis algorithm for the full array is based on the assumption that waves are propagating through water of constant depth. In fact, the depth changes by about 0.8 m (2.6 ft) over the cross-shore breadth of the array (from gauge E to gauge A), or roughly 10 percent of the total depth. Intermediate- and shallow-water waves transform, largely by refraction, as they propagate through water of changing depth. This transformation introduces a slight shift in the phase difference between waves at two cross-shore locations relative to the phase difference of waves that are not transformed. Directional spectral estimates depend critically on accurate estimates of phase difference, and the effect of transforming waves, though slight, is to introduce an increased spread in the directional distribution of wave energy, especially for waves at high angles of attack. An optical analogy is a camera with a poorly ground lens that will focus clearly at the center but is slightly blurred at the edges.

The linear array does not have this blurring effect because waves have the proper phase difference as they cross a line of constant depth. Consequently, directional spectral estimates from the linear array are better resolved in their detailed structure. Because of this better resolution, linear array results are used in this report for all characterizing parameters except reflection coefficients. Though full array results can be somewhat blurred, reflection coefficients are based on total energy in 180-deg arcs of direction, and so are less sensitive to a lack of detailed resolution than are other parameters like peak direction and directional spread. Note, however, that both linear array and full array spectra and associated parameters are computed, archived, and available through the mechanisms described in this report for all collections listed in Appendix A.

Spectral estimation

Estimation of the frequency-direction spectrum is done in five parts. First, a working gauge set is identified. Second, time series of pressure data from each of the working gauges are Fourier transformed to the frequency domain. Third, these transforms are converted to sea-surface displacement transforms. Fourth, cross spectra of sea-surface displacement are computed between all unique gauge pairs for each frequency. Finally, an estimate is made of a directional distribution of wave energy that corresponds to the computed spatial variation in cross-spectral density for each frequency.

The choice of gauges to be used in a frequency-direction spectrum at a particular frequency depends on available gauges after error checking (described previously), the wavelengths of the waves to be resolved, and somewhat on the nature of the directional distribution of wave energy being estimated. Ocean wave signals at a given frequency tend to become uncorrelated over distances of a few wavelengths. Cross spectra of signals from two gauges of high-frequency (short wavelength) waves are reduced to noise if gauge separation is too great. Conversely, cross spectra of signals from two closely spaced gauges do not yield a great deal of information about very long waves because the two signals are

almost identical. Because of these characteristics of ocean waves, sub-arrays of both the linear and 8-m arrays are defined so that minimum gauge spacing and maximum array extent are tuned to ranges of wind wave frequencies. Directional spectra are estimated using data from the gauges in these sub-arrays.

An additional constraint on gauge usage is based on the observation by Davis and Regier (1977) that occasionally the directional spectrum is of sufficiently simple shape that some of the cross-spectral information becomes redundant, meaning that too many gauges (or, perhaps, gauges in less than ideal locations) have been employed in the directional estimate. An indication of this condition is that the matrix of cross-spectral estimates becomes singular in the mathematical sense, and directional estimation becomes impossible. When this occurs in the course of a computation, the procedure is to eliminate a gauge from the sub-array being used, and restart the computation. To avoid eliminating a critical gauge, an order for gauge elimination was established that retained gauges known to be important. Because this procedure occurred in automated processing, a complete gauge elimination pattern was defined. If fewer than four gauges remained at any point in processing, the entire analysis was aborted for that collection.

Table 1 shows the wind wave frequency band sub-ranges, the sub-array of gauges to be used with each frequency sub-range, and the elimination order of gauges in each sub-array for the gauges of the linear array. A column under a gauge number that contains an integer indicates a gauge to be used for the frequency range shown in the left column. The integers in each row indicate the order in which gauges are to be eliminated. For example, in the next-to-highest frequency range of the original array (0.12 Hz $< f \le 0.21$ Hz in Table 1), gauges 1, 2, 3, 4, 5, and 6 define the sub-array. In the event that a gauge must be eliminated, gauge 6 is eliminated first. If a second gauge must be eliminated, it is gauge 5, and so on, until the four-gauge limit is reached (if necessary). Table 2 shows the same type of information for the full array.

Table 1 Linear Array Gauge Usage									
Frequency Range (Hz)	Gauge								
	1	2	3	4	5	6	7	8	9
$0.04 < f \le 0.08$	5	6		2	7	8	4	1	3
$0.08 < f \le 0.12$	4	5	1	6	7	3	2		
$0.12 < f \le 0.21$	3	4	5	6	2	1			
$0.21 < f \le 0.32$	2	3	4	5	1				

Because gauge set definition varies with frequency, and is somewhat data-adaptive in that some spectra require gauge elimination and others do not, it is important that a record be kept of the set of gauges used for each frequency in a collection analysis. This is the primary purpose of the gauge pattern parameter

Table 2
8-m Array Gauge Usage

Frequency Range (Hz)	Gauge														
	1	2	3	4	5	6	7	8	9	0	A	B	C	D	E
$0.04 < f \leq 0.08$	10	7	11		12	9	5	1	3		4	13	8	6	2
$0.08 < f \leq 0.12$	9	10	11	2	7	6	4			1		3	8	12	5
$0.12 < f \leq 0.21$	8	9	7	5	4	2				10			6	3	1
$0.21 < f \leq 0.32$	6	7	5	4	2					8			3	1	

defined previously. The gauge pattern parameter is always kept with the archived results, and the limit of the minimum of four gauges for each directional estimate is never violated. Once the appropriate set of gauges has been identified, the subsequent analysis operations of Fourier transformation, surface correction, cross-spectral computation, and directional spectral estimation can proceed.

The Fourier transform is conventional. An 8,192-sec time series is divided into 15 half-overlapping segments of 1,024 sec. Segments are tapered with a Kaiser-Bessel window (a modified Bessel function of the first kind, compensated uniformly for loss of variance due to windowing) and fast Fourier transformed. An intermediate-resolution transform is found by averaging the 15 transformed segments, frequency by frequency. Final transforms are found by then averaging results over ten adjacent frequency bands. Final resolution bandwidth is 0.00976 Hz, and degrees of freedom are at least 150 (assuming eight contiguous segments and ignoring any gain from lapped segments). Transform estimates are retained for 29 frequency bands with band-center frequencies ranging from 0.044 to 0.318 Hz.

Conversion of pressure signals at depth to water-surface displacement is done through the linearized wave theory pressure response factor as described in the *Shore Protection Manual* (1984). After this conversion, complex cross spectra in the form of coincident and quadrature spectra are computed in the conventional way (Bendat and Piersol 1971, Jenkins and Watts 1968) between all unique gauge pairs for each frequency.

Conversion of cross-spectral patterns in lag space to directional spectra is done with the Iterative Maximum Likelihood Estimation algorithm derived and described by Pawka (1982, 1983). The algorithm is also described in application to data from heave-pitch-roll buoys by Oltman-Shay and Guza (1984), and Long (1995) gives a modestly expanded description of the algorithm for two-dimensional spatial arrays. Accuracy of directional estimates depends on frequency, with high-frequency waves (short wavelengths) being better resolved by an array of finite length. Tests with artificial data indicate that the FRF linear array generally can resolve the direction of a unidirectional wave train to within 5 deg

and can distinguish two wave trains at the same frequency if their directions differ by at least 15 deg.

The algorithm used here employs discrete direction "bandwidths" or arcs of about 1 deg for all frequencies. Because this increment is finer than the resolution of any of the arrays, directional results are smoothed by integrating over 2-deg arcs and renormalizing by this arc width to create evenly spaced directional spectra at all frequencies. Because linear array results are valid only in the 180-deg arc representing seaward approach directions, dividing this range into 2-deg arcs results in 91 arc center directions with which to characterize discretely the directional distribution of wave energy from the linear array. The full array can detect wave energy from all directions, so results are represented in 181 directional bins of 2-deg width (the terminal bins are redundant).

The primary result of data processing is an estimate of the discrete frequency-direction spectrum $S(f_n, \theta_m)$, which represents the variance of sea-surface displacement per frequency resolution bandwidth df (= 0.00976 Hz) per direction resolution arc $d\theta$ (= 2 deg), where f_n is the nth of N = 29 discrete frequencies and θ_m is the mth of M = 91 (for the linear array) or 181 (for the full array) discrete directions. In this work, direction is considered to be the angle from which wave energy is coming, measured counterclockwise from shore-normal (Figure 2).

Numerical values of $S(f_n, \theta_m)$ can range over many orders of magnitude, depending on the amount of energy in a given frequency band and direction arc, and this can require space-consuming formats for archiving data. To simplify this problem, frequency-direction spectra are saved as directional distribution functions $D(f_n, \theta_m)$ defined by

$$D(f_n, \theta_m) = \frac{S(f_n, \theta_m)}{S(f_n)} \tag{1}$$

The directional distribution function has units of deg^{-1}, and its integral with respect to direction over all directions is unity.

The frequency spectrum $S(f_n)$ in Equation 1 represents the sum over all directions of sea-surface variance per frequency bandwidth and is defined in terms of the frequency-direction spectrum by

$$S(f_n) = \sum_{m=1}^{M} S(f_n, \theta_m) \, d\theta \tag{2}$$

where the variables on the right-hand side are defined above. Note that this is identical to a conventional frequency spectrum that would result from a time series of sea-surface displacement at a single point in space. Because it is an integral of the frequency-direction spectrum, it is called the integrated frequency spectrum.

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A directional analog of the frequency spectrum is the integrated direction spectrum, found by summing the frequency-direction spectrum over all frequencies for a fixed-direction arc. It is computed from

$$S(\theta_m) = \sum_{n=1}^{N} S(f_n, \theta_m)\, df \qquad (3)$$

Figures 5 and 6 show ways to display frequency-direction spectra and the corresponding integrated frequency and integrated direction spectra from the two types of array analysis for the same collection time. Figure 5 displays results from the linear array, with some characterizing parameters shown in the figure header. Note that energy is displayed only for incident waves ($|\theta_m| < 90$ deg).

Figure 6 shows results from the full array. The characterizing parameters derived from this spectral estimate are nearly the same as those for the linear array results in Figure 5, showing that the two estimates are consistent in this regard, as expected. In Figure 6, directional energy estimates cover a complete circle. The small lumps centered near directions ±155 deg are indications of reflected energy.

Bulk Parameters

Several parameters have been computed to characterize the observed spectra. There are five basic types of parameters: (a) characteristic wave height, (b) peak frequency (or its inverse, peak period), (c) peak direction, (d) directional spread, and (e) reflection coefficient. In this report, the first four of these parameters are computed from linear array results. The fifth is computed using results from the full array. Because there is more than one way to define some of these parameters, several alternate forms are presented here.

Characteristic wave height

Characteristic wave heights from spectral observations are most frequently given as H_{mo}, which is four times the standard deviation of sea-surface displacement. It can be determined from the volume under the frequency-direction spectrum by the equation

$$H_{mo}^2 = 16 \sum_{n=1}^{N} \sum_{m=1}^{M} S(f_n, \theta_m)\, df\, d\theta \qquad (4)$$

It can also be found from the integrated frequency spectrum by

$$H_{mo}^2 = 16 \sum_{n=1}^{N} S(f_n)\, df \qquad (5)$$

which is its more conventional definition, or from the integrated direction spectrum (Equation 3) by

FRF Linear Array Frequency-Direction Spectrum
Date: 22 Sep 95   at 1900 EST   for 136.53 min   with 160 dof
H_{mo} = 0.74 m $f_{p,FD}$ = 0.093 Hz $T_{p,FD}$ =10.72 sec
$\theta_{p,FD}$ = 12.0 deg   mean depth = 8.38 m
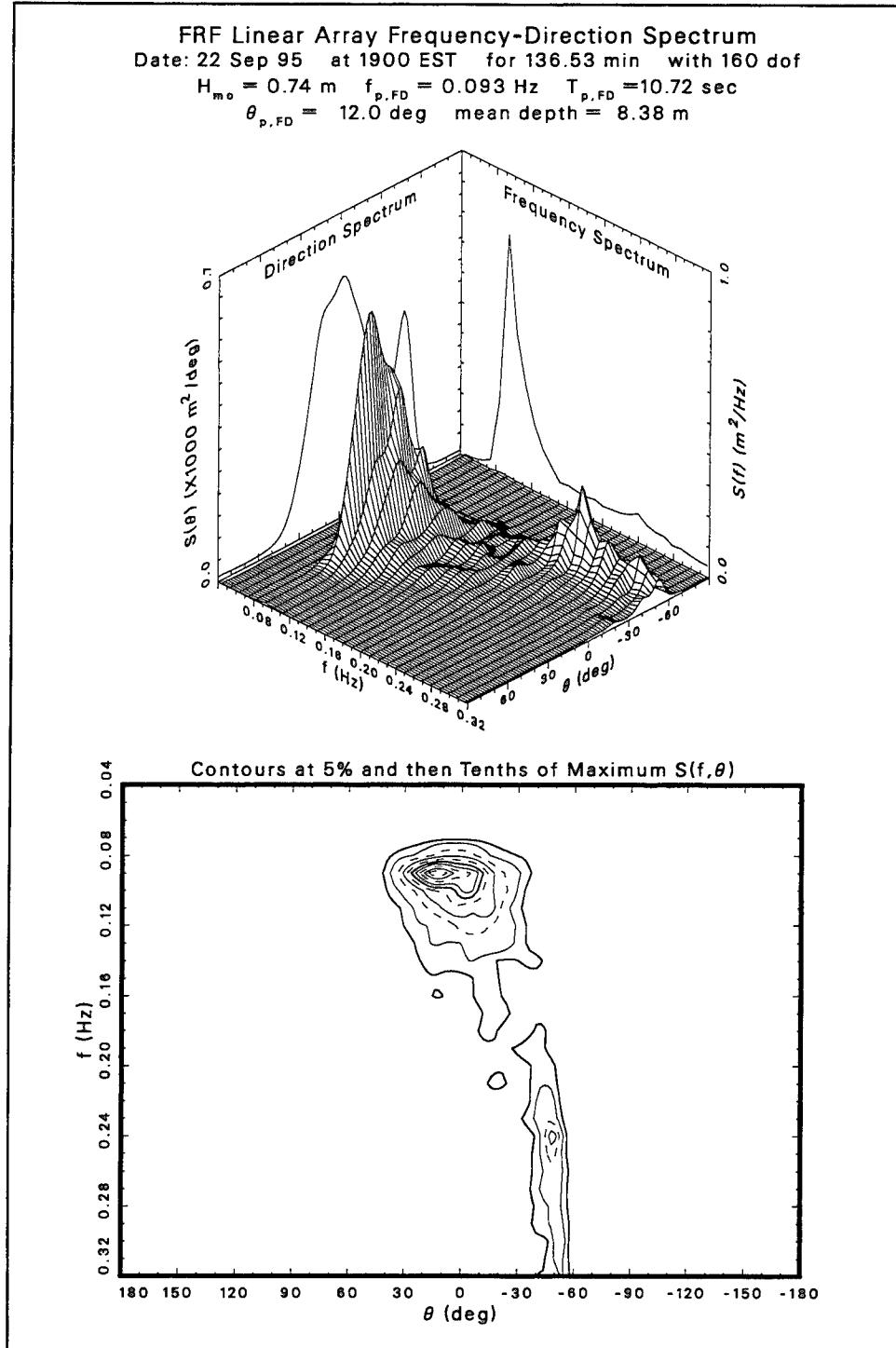
Figure 5. Example of a linear array frequency-direction spectrum

$$H_{mo}^2 = 16 \sum_{m=1}^{M} S(\theta_m)\, d\theta \qquad\qquad (6)$$
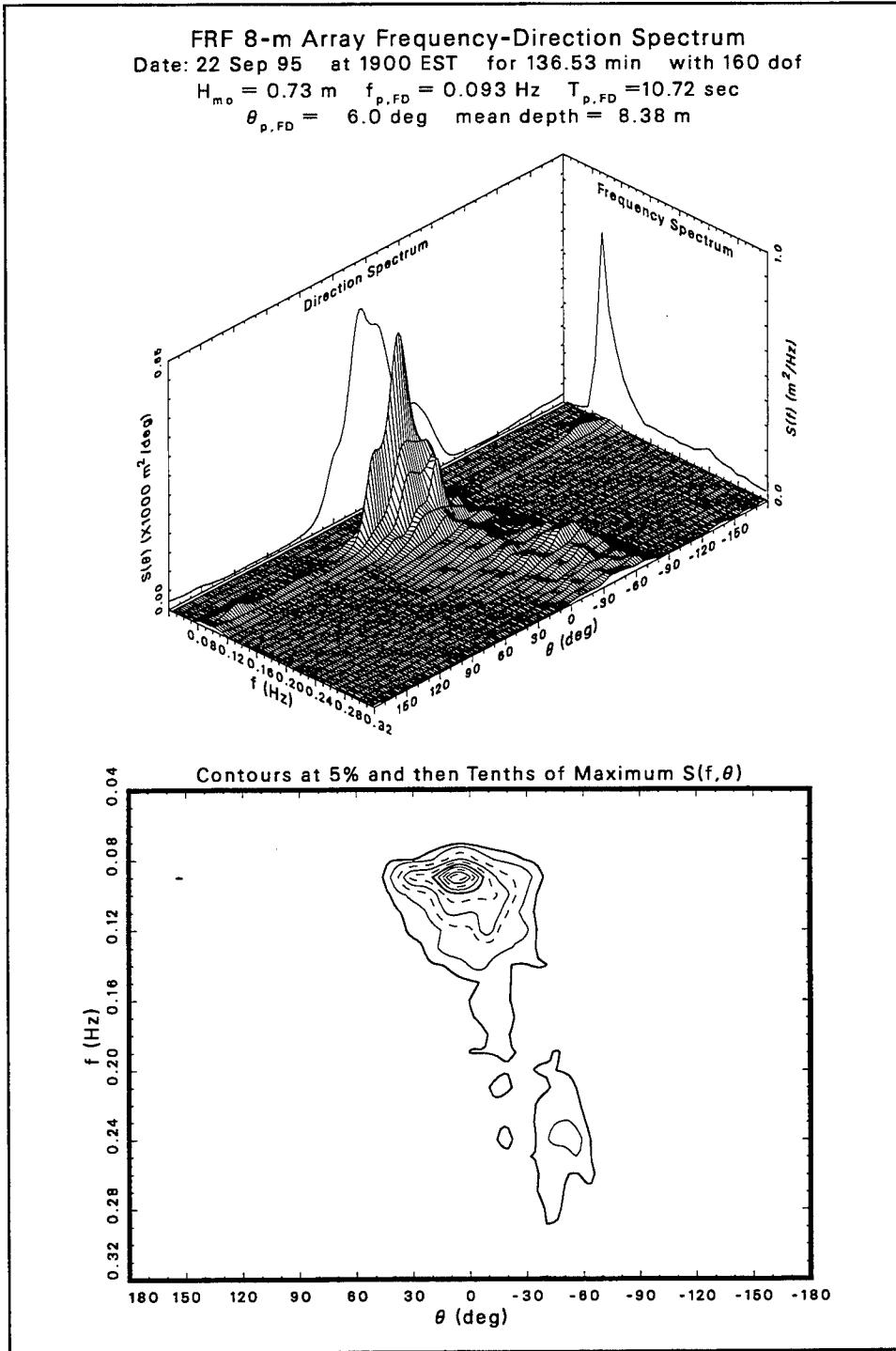
Figure 6. Example of a full-array frequency-direction spectrum

Peak frequency

Peak frequency, which has the generic notation f_p, can be defined in at least two ways. One way is to find the frequency (and direction) at which the frequency-direction spectrum is maximum. This peak frequency is denoted

$f_{p,FD}$. Another way is to find the frequency at which the integrated frequency spectrum is maximum. This is the more conventional definition, because of the plethora of measured frequency spectra, and is denoted $f_{p,JFS}$. The two peak frequencies may not be the same. If the directional distribution is broad at the frequency for which the integrated frequency spectrum is maximum, it is possible that another frequency, at which the frequency-direction spectrum has a narrow distribution, will denote the maximum of the frequency-direction spectrum.

Peak period

Peak period is the characteristic wave period associated with spectral peak frequency. Denoted generically by T_p, it is related to peak frequency by $T_p = 1/f_p$. Peak period from the frequency-direction spectrum is given by $T_{p,FD} = 1/f_{p,FD}$. Conventional peak period, derived from the integrated frequency spectrum, is given by $T_{p,JFS} = 1/f_{p,JFS}$.

Peak direction

Peak direction is the direction representing the most energy density. Given the generic symbol θ_p, it, too, can be defined in several ways. One peak direction can be defined from the maximum of the frequency-direction spectrum. It is denoted by $\theta_{p,FD}$. Another peak direction can be associated with the maximum of the integrated direction spectrum, defined previously. This peak direction is denoted $\theta_{p,JDS}$. It can differ from $\theta_{p,FD}$ if energy in the frequency-direction spectrum is centered at different directions for different frequencies. This condition tends to smear energy along the direction axis in the integrated direction spectrum, thereby shifting the peak relative to the peak of the frequency-direction spectrum. A third measure of peak direction is a weighted average peak direction defined by

$$\theta_{p,SW} = \frac{1}{\left(\frac{1}{4}H_{mo}\right)^2} \sum_{n=1}^{N} S(f_n)\,\theta_{p,n} \tag{7}$$

where

$\theta_{p,n}$ = peak direction of the directional distribution at the nth frequency of the frequency-direction spectrum

$S(f_n)$ = integrated frequency spectrum from Equation 2

and H_{mo} is defined by Equation 4. This definition gives higher weights to the more energetic peak directions, but does not rely on the single distribution with the most energy.

Directional spread

A fourth type of characteristic parameter is directional spread. This parameter, denoted generically as $\Delta\theta$, gives a measure of the range of directions from which some significant fraction of energy is propagating. The basic definition used here is the arc subtended by the middle two quartiles of a directional distribution. As illustrated in Figure 7, the directional distribution function $D(f_n, \theta_m)$ for a particular frequency f_n can be integrated from one bounding direction (here the shore-parallel direction at +90 deg) to some arbitrary direction θ_j to make a cumulative distribution function $I(f_n, \theta_j)$. The formal definition is

$$I(f_n, \theta_j) = \sum_{m=1}^{j} D(f_n, \theta_m) \, d\theta \qquad (8)$$

where j is the index of a discrete angle bin. The three quartile directions, called $\theta_{25\%,n}$, $\theta_{50\%,n}$, and $\theta_{75\%,n}$, respectively, satisfy the equations

$$I(f_n, \theta_{25\%,n}) = 0.25 \qquad (9)$$

$$I(f_n, \theta_{50\%,n}) = 0.50 \qquad (10)$$

$$I(f_n, \theta_{75\%,n}) = 0.75 \qquad (11)$$

A directional spread parameter for the nth frequency is defined by

$$\Delta\theta_n = \theta_{25\%,n} - \theta_{75\%,n} \qquad (12)$$

If Equation 12 is applied at the frequency where the frequency-direction spectrum is maximum, a measure of directional spread at the peak of the frequency-direction spectrum is obtained. This parameter is denoted $\Delta\theta_{FDP}$. If, instead of a directional distribution function at a single frequency, the normalized integrated directional spectrum is used in the set of Equations 8 to 12, a measure of bulk directional spread is obtained. This parameter is given the symbol $\Delta\theta_{IDS}$. A third measure of directional spread is found from a spectrally weighted average of the spreads from all frequencies. Denoted as $\Delta\theta_{SW}$, this parameter is found from

$$\Delta\theta_{SW} = \frac{1}{\left(\frac{1}{4} H_{mo}\right)^2} \sum_{n=1}^{N} S(f_n) \Delta\theta_n \qquad (13)$$

a. Directional distribution

b. Cumulative distribution
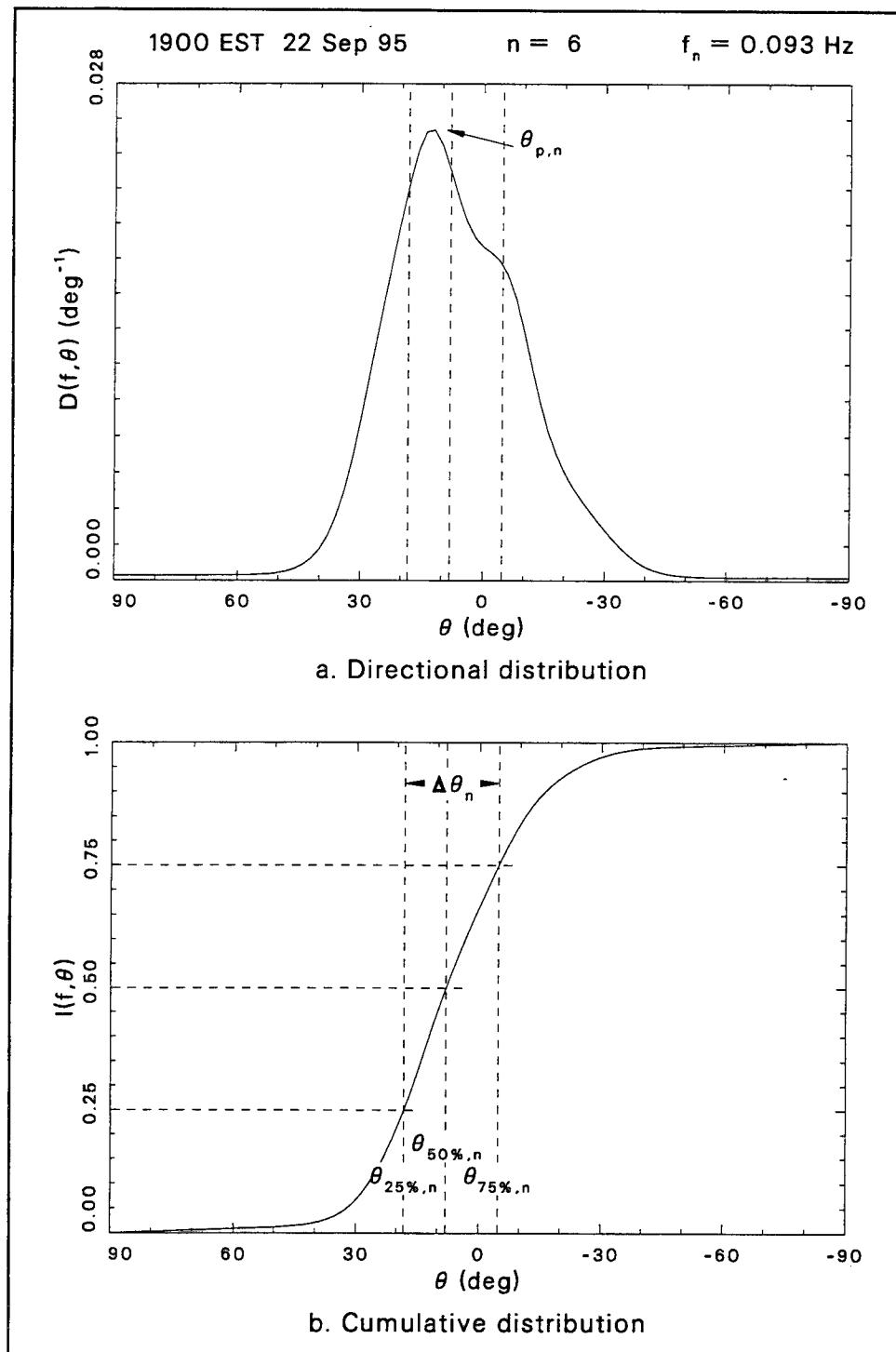
Figure 7. Directional spread computation

Reflection coefficient

Following the definition in the *Shore Protection Manual* (1984), a reflection coefficient is a ratio of incident wave height to reflected wave height. This simple definition is based on the concept of unidirectional, monochromatic waves,

which never occur in the real ocean. An adaptation of this definition for the purposes of this report is to use characteristic incident wave height $H_{mo,i}$ and characteristic reflected wave height $H_{mo,r}$ to define an energy-based reflection coefficient χ as

$$\chi = \frac{H_{mo,r}}{H_{mo,i}} \tag{14}$$

Incident and reflected wave heights are defined in terms of incident and reflected energy. Squaring both sides of Equation 14 then yields an estimate of the ratio of total reflected to total incident wind wave energy, a characteristic that may be useful in consideration of nearshore dynamics.

Some care must be exercised both in defining and interpreting the characteristic wave heights and their ratio. Intrinsic in all spectral estimates is some level of background system and analysis noise that is not related to wave signals, is often unevenly distributed in direction, and is capable of severely degrading a ratio of entities like that in Equation 14. In a rough attempt to minimize the effects of background noise, a noise estimate is made by finding the minimum of the frequency-direction spectrum at each frequency $S_{min}(f_n)$, and computing incident energy E_i and reflected energy E_r relative to these minima. Using the full-array frequency-direction spectrum for these computations, the incident energy is

$$E_i = \rho g \sum_{n=1}^{N} \sum_{m=46}^{136} w_m \left[S(f_n, \theta_m) - S_{min}(f_n) \right] d\theta \, df \tag{15}$$

and the reflected energy is

$$E_r = \rho g \sum_{n=1}^{N} \sum_{m=1}^{46} w_m \left[S(f_n, \theta_m) - S_{min}(f_n) \right] d\theta \, df$$
$$+ \rho g \sum_{n=1}^{N} \sum_{m=136}^{M} w_m \left[S(f_n, \theta_m) - S_{min}(f_n) \right] d\theta \, df \tag{16}$$

where ρ is water density, g is gravitational acceleration, and all $w_m = 1$, except $w_1 = w_{46} = w_{136} = w_M = \frac{1}{2}$. The w_m are simply convenient notations that show the proper contributions of the spectrum to the end points of the sums in Equations 15 and 16, and do not otherwise affect the integrations. In terms of incident and reflected energies, the corresponding characteristic wave heights are

$$H_{mo,i} = 4 \sqrt{\frac{E_i}{\rho g}} \tag{17}$$

and

$$H_{mo,r} = 4 \sqrt{\frac{E_r}{\rho g}} \qquad\qquad (18)$$

so that, on substitution of Equations 17 and 18 into Equation 14, the reflection coefficient becomes

$$\chi = \sqrt{\frac{E_r}{E_i}} \qquad\qquad (19)$$

The simple noise estimate used here does not eliminate the effects of noise in computing Equation 19 using Equations 15 and 16. This condition is evident in the tabular listings in Appendix A and the plotted results in Appendix B. There is a persistent background level of $\chi \approx 0.1$, which suggests that there is always about 1 percent of incident wave energy propagating back out to sea, a condition that is unlikely to be true. Synthetic tests by Long and Oltman-Shay (1993) using the algorithms described in this report indicate errors as large as 200 percent for $\chi \approx 0.1$, but with the error dropping rapidly for larger χ. A reasonable way to interpret the results in this report is to consider $\chi \geq 0.2$ as indicative of some reflection, and then to examine such spectra in detail for verification. In the spectrum shown in Figure 6, for example, the tabulated reflection coefficient is 0.23, and the figure does indeed indicate some reflected energy.

Parameter summary

Together, the 12 parameters H_{mo}, $f_{p,FD}$, $f_{p,IFS}$, $T_{p,FD}$, $T_{p,IFS}$, $\theta_{p,FD}$, $\theta_{p,IDS}$, $\theta_{p,SW}$, $\Delta\theta_{IDS}$, $\Delta\theta_{SW}$, $\Delta\theta_{FDP}$, and χ give a bulk characterization of some properties of the frequency-direction spectra discussed in this report. There are, of course, many other parameters that can be defined, but the present set is simple, and is easier to use than the 2,639 discrete spectral densities (29 frequencies $\times$ 91 directions) required for a full description of any linear array spectrum, or the 5,249 elements (29 frequencies $\times$ 181 directions) of any full-array spectrum discussed here.

6 Archived Results

Optical disks containing the sets of observed linear-array and full-array frequency-direction spectra from this collection period have been created to archive the observations. Appendix A contains a listing of the date, starting time (EST), and the characterizing parameters defined previously for each case archived. It serves as an index or catalog of the set of available cases. For reasons explained below, dates in Appendix A are given in the form *yymmdd* to represent year, month, and day, all in two-digit integer form.

Graphic representations of data collection times, some bulk parameters, and some auxiliary environmental variables are contained in Appendix B. One graph is shown for each month of the collection period. The upper part of each graph has time series plots of the bulk parameters H_{mo}, $T_{p,IFS}$, $\theta_{p,IDS}$, and $\Delta\theta_{IDS}$ derived from the linear array, and χ derived from the full array. The lower part of each graph has stick figure plots of two environmental variables. First is a kind of crude wave vector in which the stick vector has a length proportional to H_{mo} and a direction given by $\theta_{p,IDS}$ + 180 deg. The 180 deg is added to provide a physical frame of reference consistent with a vector pointing in the direction of energy propagation. Because peak wave energy is always directed onshore, all stick vectors in this part of the graph will have a component directed upward on the page.

The second stick figure plot is a wind vector as measured with one of the two FRF pier-end anemometers. Mounted at the seaward end of the FRF pier (Figure 2) at an elevation 19.5 m above mean sea level, these instruments give a reasonable estimate of the wind climate in the vicinity of the 8-m array. Prior to April 1996, there were two anemometers located near the landward symbol of the two anemometer symbols shown in Figure 2. Both anemometers were of the impeller-vane type, and were separated horizontally by less than 2 m (to ensure uninterrupted wind observations in the event of failure of one of them). In April 1996, wind measurements were reduced to a single anemometer mounted at 19.4 m above mean sea level on a boom supported by a tower at the seaward end of the pier. Position of this anemometer is shown in Figure 2 as the seaward symbol of the two anemometer symbols. Anemometer data are vector averaged and wind velocity variances are computed both in and perpendicular to the mean wind direction.

Archived with wave spectral results are mean wind speed, maximum wind speed, wind speed standard deviation, mean wind direction, and a measure of wind direction variability (defined as the arc tangent of the ratio of cross-stream standard deviation of wind velocity to the mean wind speed). The archive was designed to store information from two anemometers. Where only one anemometer is functioning, a value of -3.0 is entered as wind speed, and 0.0 for all other parameters of the non-functioning anemometer. Because a negative number is not possible for any real wind speed, this method of recording serves as a flag for missing anemometer data, yet retains the structure of the basic data archive.

7   Retrieving Processed Data

The electro-optical medium containing the directional-spectral data archive is compact, but not very transportable. Consequently, a conversion program has been written to transform the data into a rather conventional, 80-column formatted form that is much more easily distributed on common magnetic media or over an electronic network. A user requesting some or all of the data will, unless otherwise specified, receive the data in formatted form. It may be possible to transfer the data in other ways, and specific requests can be coordinated with the FRF.

The data archive for the period covered by this report contains two sets of 2,812 files, one set for linear array results, and the other for full array results, with one file for each collection. In formatted form, a linear array file has a length of about 30,000 bytes, and a full array file is about twice this size. The complete archive for this collection period contains roughly 253 MB of information. A user may wish to consider whether this quantity of information will take too much system space before trying to copy the whole archive. Subsets of data covering specific time periods can readily be created by the FRF.

An ASCII-formatted file is usually named LA*yymmddhhmm*.ASC for a linear array frequency-direction spectrum, or FD*yymmddhhmm*.ASC for a full array frequency-direction spectrum. In these file names, the character grouping *yymmdd* represents the data collection date (as listed in Appendix A), and the character grouping *hhmm* represents the data collection start time as hour and minute, both in two-digit integer form (also from Appendix A).

Once a file is on equipment and in a position to be read, it can be input to a computer program through a set of ASCII read statements. Appendix C contains a listing of a FORTRAN program that can read the formatted data files. The variables contained in a data file are listed in the header of the program in Appendix C. A listing of a sample data file of linear array results is given in Appendix D. Read statements in the program in Appendix C can be aligned with data fields of the listing in Appendix D if the user wishes to edit or visually read a data file. Program variable names, especially those that have parallel symbols in this text, are also listed in the Notation (Appendix E).

A user can obtain data by communicating with the FRF via:

Surface mail	Chief, Field Research Facility
	1261 Duck Road
	Kitty Hawk, NC 27949-4472
Telephone	(919) 261-3511
FAX	(919) 261-4432

or any of the following Internet addresses:

c.long@cerc.wes.army.mil
c.baron@cerc.wes.army.mil
w.birkemeier@cerc.wes.army.mil

More information about the FRF, a partial set of the statistics H_{mo}, $T_{p,JFS}$, and $\theta_{p,FD}$ from the full array, and all of the LA*yymmddhhmm*.ASC files are available at *http://www.frf.usace.army.mil* on the World Wide Web.

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8 Summary of Results

Data from the tenth collection year of high-resolution directional-spectral observations at the FRF have been put in a form that is easily accessible to researchers interested in nearshore processes. Directional gauge array, directional analysis algorithms, and definitions of characterizing parameters are described in the body of this report, as are the location and form of archived data. Both a listing and a graphic presentation of data collection times and characteristic parameters are given in the appendixes. The appendixes also contain a sample data file and a listing of a FORTRAN program that can be used to read a data file.

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Appendix A
Table of Collection Times and Bulk Parameters

Table A1
Collection Times and Bulk Parameters

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	x
950901	0100	0.79	0.093	0.083	10.72	11.98	-34.0	-12.0	-18.9	31.1	29.2	32.1	0.18
950901	0400	0.76	0.093	0.093	10.72	10.72	-34.0	-32.0	-19.6	29.9	28.2	28.2	0.14
950901	0700	0.74	0.093	0.093	10.72	10.72	-12.0	-14.0	-20.0	28.2	26.8	29.8	0.22
950901	1000	0.80	0.103	0.093	9.71	10.72	-36.0	-34.0	-28.3	25.8	24.9	24.6	0.22
950901	1300	0.78	0.093	0.093	10.72	10.72	-32.0	-18.0	-22.9	24.1	23.0	22.1	0.23
950901	1600	0.72	0.093	0.093	10.72	10.72	-34.0	-32.0	-30.4	26.2	22.6	25.3	0.18
950901	1900	0.70	0.093	0.093	10.72	10.72	-12.0	-32.0	-25.3	31.3	24.2	25.9	0.22
950901	2200	0.81	0.093	0.093	10.72	10.72	-16.0	-36.0	4.0	50.7	30.8	22.1	0.21
950902	0100	0.87	0.093	0.093	10.72	10.72	-22.0	-38.0	7.3	79.6	23.6	20.9	0.20
950902	0400	0.92	0.093	0.093	10.72	10.72	-32.0	58.0	14.1	75.6	22.4	26.0	0.21
950902	0700	1.33	0.191	0.083	5.24	11.98	40.0	42.0	24.3	57.7	19.6	23.7	0.17
950902	1000	1.07	0.093	0.093	10.72	10.72	-20.0	30.0	7.9	63.5	25.4	23.4	0.20
950902	1300	0.93	0.210	0.093	4.75	10.72	24.0	26.0	13.2	68.1	28.0	37.2	0.24
950902	1600	0.97	0.083	0.093	11.98	10.72	-38.0	-24.0	13.7	72.4	25.1	28.4	0.22
950902	1900	0.95	0.083	0.083	11.98	11.98	-12.0	-20.0	15.4	60.8	28.3	30.5	0.18
950902	2200	1.02	0.083	0.093	11.98	10.72	-16.0	20.0	5.8	45.1	26.7	33.1	0.20
950903	0100	1.02	0.083	0.083	11.98	11.98	-14.0	2.0	1.0	41.2	26.5	30.0	0.18
950903	0400	1.00	0.074	0.083	13.56	11.98	-24.0	2.0	3.6	42.2	28.2	38.8	0.17
950903	0700	1.19	0.074	0.083	13.56	11.98	-22.0	2.0	7.9	43.3	25.0	31.0	0.15
950903	1000	1.28	0.083	0.083	11.98	11.98	-22.0	2.0	8.8	42.9	30.0	34.3	0.13
950903	1300	1.23	0.083	0.083	11.98	11.98	-16.0	2.0	5.3	36.7	30.0	26.5	0.14
950903	1600	1.22	0.093	0.093	10.72	10.72	-6.0	-6.0	5.6	36.2	31.0	32.8	0.15
950903	1900	1.22	0.083	0.083	11.98	11.98	-14.0	-4.0	-2.0	33.3	29.7	28.7	0.12
950903	2200	1.36	0.132	0.083	7.56	11.98	0.0	-4.0	-2.8	28.7	27.6	29.9	0.12
950904	0100	1.39	0.132	0.093	7.56	10.72	-4.0	-4.0	0.6	29.9	27.7	36.6	0.14
950904	0400	1.30	0.074	0.083	13.56	11.98	-14.0	-6.0	2.0	30.2	27.7	26.3	0.15
950904	0700	1.22	0.083	0.083	11.98	11.98	-6.0	-4.0	1.5	30.8	27.5	28.4	0.12
950904	1000	1.17	0.083	0.083	11.98	11.98	-8.0	-2.0	-0.1	29.2	27.6	26.4	0.13
950904	1300	1.19	0.093	0.093	10.72	10.72	-8.0	-10.0	-0.6	28.7	27.7	23.6	0.15
950904	1600	1.20	0.074	0.083	13.56	11.98	-10.0	-8.0	0.5	28.4	27.0	26.0	0.16
950904	1900	1.14	0.093	0.093	10.72	10.72	-6.0	-2.0	-3.6	28.5	26.4	24.8	0.13
950904	2200	1.14	0.074	0.083	13.56	11.98	-16.0	-4.0	-2.0	28.2	27.2	26.5	0.12

(Sheet 1 of 54)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
950905	0100	1.08	0.074	0.093	13.56	10.72	-18.0	-4.0	-1.5	30.2	29.8	28.4	0.14
950905	0400	1.07	0.064	0.093	15.63	10.72	-12.0	-8.0	-2.7	29.4	27.6	27.3	0.18
950905	0700	1.10	0.064	0.074	15.63	13.56	-14.0	-14.0	-5.2	27.2	26.1	18.7	0.14
950905	1000	1.14	0.064	0.074	15.63	13.56	-6.0	-6.0	-3.5	28.1	27.2	19.5	0.13
950905	1300	1.15	0.074	0.074	13.56	13.56	-16.0	-14.0	-7.5	28.1	26.5	14.3	0.15
950905	1600	1.14	0.074	0.074	13.56	13.56	-16.0	-10.0	-7.8	28.2	27.4	15.1	0.15
950905	1900	1.10	0.074	0.074	13.56	13.56	-16.0	-16.0	-6.7	29.9	27.1	14.6	0.16
950905	2200	1.13	0.074	0.074	13.56	13.56	-18.0	-22.0	-3.2	29.4	26.0	16.7	0.13
950906	0100	1.16	0.074	0.074	13.56	13.56	-12.0	-20.0	-8.3	30.0	25.8	15.5	0.17
950906	0400	1.14	0.074	0.064	13.56	15.63	-20.0	-22.0	-8.2	31.4	27.3	19.8	0.17
950906	0700	1.15	0.064	0.064	15.63	15.63	-36.0	-20.0	-17.0	28.9	26.5	18.8	0.17
950906	1000	1.23	0.074	0.074	13.56	13.56	-18.0	-16.0	-16.2	24.1	23.1	18.5	0.13
950906	1300	1.26	0.074	0.074	13.56	13.56	-32.0	-32.0	-19.6	27.5	25.2	21.8	0.16
950906	1600	1.30	0.074	0.074	13.56	13.56	-36.0	-36.0	-29.5	27.5	23.4	18.7	0.24
950906	1900	1.21	0.064	0.083	15.63	11.98	-38.0	-36.0	-30.7	26.2	25.0	27.4	0.19
950906	2200	1.10	0.074	0.074	13.56	13.56	-22.0	-22.0	-26.0	27.8	26.7	20.3	0.14
950907	0100	1.18	0.064	0.074	15.63	13.56	-38.0	-36.0	-27.0	30.9	28.4	25.2	0.17
950907	0400	1.17	0.074	0.074	13.56	13.56	-34.0	-36.0	-29.5	31.2	27.0	22.8	0.20
950907	0700	1.08	0.074	0.074	13.56	13.56	-32.0	-32.0	-33.9	27.9	26.1	12.2	0.20
950907	1000	1.06	0.064	0.074	15.63	13.56	-34.0	-34.0	-34.6	25.8	24.7	18.1	0.15
950907	1300	1.16	0.074	0.074	13.56	13.56	-32.0	-32.0	-32.3	24.4	24.7	19.6	0.17
950907	1600	1.28	0.074	0.074	13.56	13.56	-34.0	-34.0	-35.4	24.4	23.3	13.6	0.21
950907	1900	1.28	0.074	0.074	13.56	13.56	-32.0	-34.0	-37.0	24.2	23.4	14.6	0.22
950907	2200	1.15	0.074	0.064	13.56	15.63	-28.0	-30.0	-29.4	23.2	23.2	14.2	0.15
950908	0100	1.22	0.074	0.074	13.56	13.56	-34.0	-32.0	-30.1	23.3	23.1	17.2	0.15
950908	0400	1.24	0.074	0.074	13.56	13.56	-34.0	-34.0	-30.5	25.6	24.6	14.3	0.20
950908	0700	1.11	0.074	0.074	13.56	13.56	-34.0	-34.0	-31.9	27.1	25.9	17.3	0.20
950908	1000	1.04	0.074	0.074	13.56	13.56	-34.0	-34.0	-32.7	25.8	26.4	18.3	0.17
950908	1300	1.09	0.074	0.074	13.56	13.56	-32.0	-32.0	-31.1	24.3	25.9	18.0	0.16
950908	1600	1.16	0.074	0.074	13.56	13.56	-32.0	-32.0	-34.0	25.5	24.8	13.4	0.24
950908	1900	1.19	0.074	0.074	13.56	13.56	-30.0	-30.0	-34.3	20.3	21.9	8.0	0.22
950908	2200	1.13	0.064	0.064	15.63	15.63	-36.0	-34.0	-32.7	22.4	25.6	17.2	0.19
950909	0100	1.20	0.064	0.064	15.63	15.63	-34.0	-34.0	-29.0	23.8	26.1	19.3	0.19
950909	0400	1.31	0.064	0.064	15.63	15.63	-38.0	-36.0	-31.6	24.2	25.3	15.7	0.21
950909	0700	1.44	0.074	0.064	13.56	15.63	-32.0	-32.0	-30.3	19.2	21.9	14.1	0.22
950909	1000	1.35	0.064	0.064	15.63	15.63	-36.0	-32.0	-32.6	22.7	23.5	13.1	0.20
950909	1300	1.50	0.064	0.064	15.63	15.63	-38.0	-38.0	-29.3	21.2	21.2	19.2	0.18
950909	1600	1.74	0.064	0.064	15.63	15.63	-24.0	-26.0	-22.2	23.7	23.0	16.6	0.21
950909	1900	1.95	0.054	0.054	18.45	18.45	-20.0	-24.0	-25.9	25.9	28.5	28.8	0.25
950909	2200	2.05	0.064	0.054	15.63	18.45	-24.0	-24.0	-17.2	22.7	25.5	23.6	0.19
950910	0100	1.72	0.064	0.064	15.63	15.63	-20.0	-22.0	-16.8	22.3	24.1	19.7	0.18
950910	0400	1.48	0.064	0.064	15.63	15.63	-20.0	-22.0	-15.7	24.9	23.2	17.8	0.19
950910	0700	1.20	0.074	0.064	13.56	15.63	-22.0	-22.0	-13.7	33.9	27.2	21.2	0.24
950910	1000	1.13	0.074	0.074	13.56	13.56	-20.0	-18.0	-9.4	30.0	26.2	16.6	0.27
950910	1300	1.56	0.074	0.083	13.56	11.98	-10.0	-12.0	1.2	46.7	20.0	23.2	0.16
950910	1600	1.61	0.093	0.093	10.72	10.72	-14.0	-12.0	4.0	43.4	21.1	15.3	0.14
950910	1900	1.43	0.171	0.083	5.83	11.98	34.0	-16.0	6.2	41.1	23.1	25.4	0.16
950910	2200	1.40	0.093	0.093	10.72	10.72	-4.0	-4.0	7.8	31.4	24.9	21.7	0.13
950911	0100	1.52	0.093	0.093	10.72	10.72	-4.0	-4.0	5.7	27.3	26.4	19.4	0.10
950911	0400	1.50	0.093	0.093	10.72	10.72	-4.0	-4.0	5.8	30.0	28.4	17.3	0.10
950911	0700	1.34	0.093	0.103	10.72	9.71	-4.0	-4.0	6.4	33.3	32.3	29.5	0.14
950911	1000	1.30	0.103	0.103	9.71	9.71	-2.0	2.0	14.1	34.6	32.9	27.7	0.13
950911	1300	1.29	0.113	0.113	8.87	8.87	-36.0	4.0	10.1	38.7	30.3	32.1	0.10
950911	1600	1.28	0.093	0.093	10.72	10.72	4.0	0.0	9.5	36.9	32.0	17.7	0.10

(Sheet 2 of 54)

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
950911	1900	1.34	0.083	0.181	11.98	5.52	10.0	10.0	13.7	33.1	29.9	29.4	0.11
950911	2200	1.24	0.103	0.093	9.71	10.72	2.0	2.0	17.4	32.7	29.0	18.8	0.12
950912	0100	1.16	0.093	0.093	10.72	10.72	4.0	4.0	15.9	33.0	31.5	14.4	0.10
950912	0400	1.09	0.093	0.093	10.72	10.72	-4.0	0.0	10.7	33.2	33.5	21.7	0.11
950912	0700	1.05	0.103	0.103	9.71	9.71	6.0	6.0	12.5	33.7	31.9	18.4	0.13
950912	1000	0.96	0.103	0.132	9.71	7.56	6.0	4.0	1.0	31.4	30.0	25.4	0.13
950912	1300	0.98	0.113	0.113	8.87	8.87	-2.0	0.0	-1.6	29.9	28.7	19.8	0.11
950912	1600	1.03	0.123	0.123	8.16	8.16	-8.0	-8.0	-8.0	28.5	28.7	19.2	0.11
950912	1900	1.11	0.132	0.123	7.56	8.16	-6.0	-4.0	-10.3	28.6	28.6	23.8	0.13
950912	2200	1.01	0.132	0.132	7.56	7.56	-16.0	-8.0	-8.6	28.5	28.8	19.0	0.16
950913	0100	0.94	0.132	0.132	7.56	7.56	-6.0	-2.0	-10.0	27.7	28.6	21.9	0.14
950913	0400	0.91	0.132	0.132	7.56	7.56	-10.0	-8.0	-9.9	26.0	25.9	19.9	0.13
950913	0700	0.89	0.142	0.142	7.04	7.04	-14.0	-14.0	-17.5	27.2	27.4	19.8	0.15
950913	1000	0.79	0.152	0.152	6.59	6.59	-26.0	-12.0	-13.0	29.1	29.2	28.6	0.18
950913	1300	0.72	0.152	0.152	6.59	6.59	-26.0	-12.0	-14.6	27.8	28.2	21.8	0.17
950913	1600	0.67	0.162	0.152	6.19	6.59	-24.0	-24.0	-21.7	28.2	27.1	24.3	0.15
950913	1900	0.66	0.093	0.093	10.72	10.72	-8.0	-20.0	-20.5	29.5	23.2	25.8	0.19
950913	2200	0.64	0.093	0.093	10.72	10.72	-8.0	-16.0	-21.9	27.4	22.9	22.8	0.27
950914	0100	0.62	0.103	0.103	9.71	9.71	-12.0	-12.0	-18.5	23.9	22.0	19.3	0.22
950914	0400	0.67	0.083	0.083	11.98	11.98	-8.0	-28.0	-20.4	23.9	22.8	23.3	0.19
950914	0700	0.70	0.083	0.083	11.98	11.98	-18.0	-20.0	-22.6	23.4	22.6	23.6	0.21
950914	1000	0.66	0.083	0.083	11.98	11.98	-20.0	-20.0	-20.5	25.6	25.0	21.6	0.27
950914	1300	0.61	0.093	0.093	10.72	10.72	-14.0	-16.0	-18.8	23.7	23.2	19.8	0.23
950914	1600	0.59	0.093	0.093	10.72	10.72	-12.0	-14.0	-19.6	21.9	21.5	18.8	0.18
950914	1900	0.57	0.093	0.093	10.72	10.72	-14.0	-16.0	-20.7	23.6	22.2	20.4	0.27
950914	2200	0.56	0.093	0.093	10.72	10.72	-10.0	-12.0	-17.0	25.2	24.1	23.1	0.34
950915	0100	0.60	0.093	0.093	10.72	10.72	-8.0	-12.0	-13.2	25.9	24.4	23.0	0.28
950915	0400	0.64	0.093	0.093	10.72	10.72	-6.0	-10.0	-12.5	26.4	26.1	25.6	0.21
950915	0700	1.37	0.210	0.220	4.75	4.54	48.0	48.0	35.2	35.0	20.8	18.3	0.15
950915	1000	1.65	0.162	0.171	6.19	5.83	40.0	46.0	33.1	31.5	25.6	19.6	0.14
950915	1300	1.73	0.152	0.162	6.59	6.19	30.0	28.0	30.5	27.7	24.2	19.3	0.15
950915	1600	1.71	0.152	0.152	6.59	6.59	32.0	26.0	27.0	29.4	24.7	17.5	0.13
950915	1900	1.62	0.162	0.152	6.19	6.59	34.0	22.0	21.9	31.0	27.0	17.7	0.10
950915	2200	1.67	0.162	0.162	6.19	6.19	16.0	16.0	18.9	35.3	32.2	26.1	0.09
950916	0100	1.65	0.152	0.152	6.59	6.59	20.0	14.0	20.7	35.3	33.3	19.8	0.09
950916	0400	1.66	0.152	0.152	6.59	6.59	8.0	12.0	11.6	36.0	35.3	25.5	0.09
950916	0700	1.72	0.171	0.162	5.83	6.19	24.0	10.0	9.6	38.8	37.6	34.2	0.09
950916	1000	1.63	0.162	0.162	6.19	6.19	18.0	8.0	4.2	39.0	38.1	30.6	0.10
950916	1300	1.59	0.181	0.181	5.52	5.52	-10.0	-10.0	3.5	41.5	39.8	37.6	0.11
950916	1600	1.56	0.113	0.171	8.87	5.83	-12.0	-10.0	-3.9	44.3	48.4	47.1	0.14
950916	1900	1.49	0.152	0.152	6.59	6.59	-20.0	-20.0	-2.4	39.3	42.4	36.8	0.12
950916	2200	1.40	0.123	0.123	8.16	8.16	-6.0	-6.0	-7.5	36.4	40.5	22.0	0.13
950917	0100	1.31	0.123	0.123	8.16	8.16	-6.0	-4.0	-22.6	35.2	37.7	19.6	0.15
950917	0400	1.19	0.123	0.123	8.16	8.16	-4.0	-10.0	-20.3	33.6	31.9	24.7	0.12
950917	0700	1.22	0.123	0.123	8.16	8.16	-2.0	0.0	-21.3	33.3	29.5	21.7	0.12
950917	1000	1.20	0.123	0.123	8.16	8.16	-6.0	-8.0	-22.5	31.0	25.0	14.5	0.12
950917	1300	1.04	0.123	0.123	8.16	8.16	-8.0	-10.0	-23.3	34.7	27.8	21.8	0.14
950917	1600	0.94	0.123	0.123	8.16	8.16	-2.0	-4.0	-17.5	30.3	27.2	23.0	0.18
950917	1900	0.98	0.123	0.123	8.16	8.16	-26.0	-10.0	-4.6	39.8	28.9	23.2	0.13
950917	2200	1.08	0.123	0.123	8.16	8.16	-4.0	-6.0	9.1	63.4	25.6	20.7	0.13
950918	0100	1.07	0.220	0.132	4.54	7.56	48.0	48.0	25.6	59.3	23.0	21.2	0.16
950918	0400	0.97	0.201	0.210	4.98	4.75	40.0	40.0	21.7	52.1	27.3	13.7	0.15
950918	0700	0.96	0.210	0.210	4.75	4.75	40.0	38.0	19.6	46.1	30.5	24.0	0.13

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	x
950918	1000	1.04	0.230	0.230	4.35	4.35	42.0	40.0	19.1	45.8	31.3	25.7	0.13
950918	1300	1.12	0.074	0.210	13.56	4.75	-34.0	40.0	23.7	43.6	31.6	25.6	0.13
950918	1600	1.38	0.074	0.191	13.56	5.24	-38.0	20.0	18.3	40.9	27.0	21.8	0.13
950918	1900	1.62	0.181	0.181	5.52	5.52	16.0	2.0	14.9	40.5	27.7	26.5	0.12
950918	2200	1.81	0.162	0.171	6.19	5.83	12.0	2.0	13.9	38.4	26.8	22.7	0.11
950919	0100	1.82	0.074	0.162	13.56	6.19	-28.0	-4.0	9.0	39.7	26.4	19.6	0.12
950919	0400	1.89	0.074	0.171	13.56	5.83	-38.0	-2.0	11.2	43.0	25.9	23.6	0.13
950919	0700	2.16	0.074	0.152	13.56	6.59	-38.0	2.0	8.9	40.0	24.0	13.2	0.12
950919	1000	2.20	0.074	0.152	13.56	6.59	-38.0	-2.0	10.3	39.5	25.1	23.7	0.12
950919	1300	2.17	0.074	0.152	13.56	6.59	-38.0	-2.0	10.6	47.9	26.2	30.4	0.15
950919	1600	2.13	0.074	0.152	13.56	6.59	-38.0	-38.0	8.5	47.8	26.3	27.7	0.15
950919	1900	2.07	0.074	0.152	13.56	6.59	-28.0	2.0	7.3	43.2	26.1	22.0	0.14
950919	2200	2.07	0.074	0.074	13.56	13.56	-26.0	-24.0	6.5	40.7	27.4	12.7	0.12
950920	0100	1.99	0.113	0.123	8.87	8.16	-2.0	-2.0	6.8	39.3	29.5	23.9	0.11
950920	0400	1.77	0.113	0.113	8.87	8.87	-2.0	0.0	6.7	38.6	32.5	22.4	0.12
950920	0700	1.67	0.113	0.113	8.87	8.87	0.0	0.0	8.2	35.9	30.8	25.4	0.12
950920	1000	1.65	0.113	0.103	8.87	9.71	-10.0	-10.0	3.1	34.5	30.6	26.9	0.11
950920	1300	1.54	0.103	0.103	9.71	9.71	0.0	0.0	0.4	33.8	30.6	21.9	0.13
950920	1600	1.42	0.103	0.103	9.71	9.71	4.0	2.0	0.5	34.2	31.2	22.4	0.16
950920	1900	1.36	0.103	0.093	9.71	10.72	2.0	-4.0	0.8	30.0	29.3	27.2	0.14
950920	2200	1.33	0.103	0.093	9.71	10.72	-2.0	0.0	3.9	27.4	27.7	24.3	0.11
950921	0100	1.27	0.103	0.103	9.71	9.71	2.0	2.0	2.3	28.2	26.7	25.2	0.14
950921	0400	1.33	0.093	0.093	10.72	10.72	4.0	2.0	0.6	27.3	26.5	22.4	0.18
950921	0700	1.37	0.083	0.083	11.98	11.98	6.0	6.0	4.0	25:2	25.4	19.4	0.15
950921	1000	1.39	0.083	0.083	11.98	11.98	8.0	6.0	1.4	24.8	24.6	22.5	0.11
950921	1300	1.35	0.083	0.083	11.98	11.98	10.0	6.0	3.9	24.8	25.2	26.2	0.13
950921	1600	1.24	0.083	0.083	11.98	11.98	10.0	8.0	3.0	25.6	25.9	22.2	0.20
950921	1900	1.12	0.083	0.083	11.98	11.98	10.0	6.0	4.6	24.9	25.3	21.4	0.15
950921	2200	1.15	0.093	0.093	10.72	10.72	6.0	6.0	0.3	25.5	25.5	19.6	0.11
950922	0100	1.13	0.093	0.093	10.72	10.72	10.0	8.0	1.8	26.1	25.0	22.2	0.13
950922	0400	1.06	0.083	0.083	11.98	11.98	8.0	8.0	0.6	25.3	23.2	16.6	0.22
950922	0700	0.98	0.083	0.083	11.98	11.98	8.0	6.0	-0.6	28.6	24.8	21.1	0.19
950922	1000	0.94	0.093	0.083	10.72	11.98	6.0	6.0	-8.0	39.7	23.8	23.7	0.18
950922	1300	0.91	0.093	0.093	10.72	10.72	10.0	-54.0	-12.7	48.7	22.0	19.1	0.22
950922	1600	0.85	0.093	0.093	10.72	10.72	12.0	10.0	-10.4	44.5	22.1	18.5	0.24
950922	1900	0.74	0.093	0.093	10.72	10.72	12.0	-2.0	-12.4	37.9	23.9	23.0	0.23
950922	2200	1.12	0.201	0.093	4.98	10.72	54.0	56.0	40.3	51.7	18.9	19.8	0.23
950923	0100	2.09	0.162	0.162	6.19	6.19	42.0	44.0	41.7	18.9	15.5	10.5	0.22
950923	0400	2.27	0.152	0.152	6.59	6.59	36.0	36.0	38.9	22.7	17.6	11.4	0.23
950923	0700	2.17	0.152	0.142	6.59	7.04	24.0	28.0	33.9	25.7	19.7	21.2	0.22
950923	1000	2.21	0.142	0.142	7.04	7.04	20.0	32.0	33.2	24.1	20.3	15.4	0.19
950923	1300	2.23	0.142	0.142	7.04	7.04	28.0	26.0	33.1	25.1	21.2	15.8	0.19
950923	1600	1.99	0.132	0.132	7.56	7.56	18.0	20.0	28.4	26.4	22.8	14.9	0.18
950923	1900	1.96	0.162	0.162	6.19	6.19	22.0	22.0	30.2	27.6	22.0	18.2	0.18
950923	2200	1.84	0.162	0.162	6.19	6.19	24.0	24.0	26.1	29.7	22.9	15.9	0.17
950924	0100	1.75	0.152	0.152	6.59	6.59	16.0	18.0	22.2	31.1	26.5	24.4	0.12
950924	0400	1.73	0.171	0.162	5.83	6.19	20.0	2.0	22.7	33.4	27.0	26.0	0.14
950924	0700	1.69	0.171	0.171	5.83	5.83	16.0	2.0	21.0	33.7	27.3	25.9	0.15
950924	1000	1.61	0.171	0.171	5.83	5.83	22.0	0.0	20.7	33.3	27.3	28.6	0.13
950924	1300	1.53	0.171	0.162	5.83	6.19	34.0	2.0	20.1	36.7	31.6	32.4	0.11
950924	1600	1.63	0.142	0.162	7.04	6.19	6.0	0.0	13.9	37.7	32.7	36.1	0.12
950924	1900	1.59	0.142	0.171	7.04	5.83	0.0	2.0	17.3	37.8	32.8	34.1	0.13
950924	2200	1.57	0.152	0.152	6.59	6.59	10.0	2.0	18.5	34.9	32.0	26.0	0.11

Table A1 (Continued)													
Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
950925	0100	1.48	0.142	0.142	7.04	7.04	10.0	6.0	12.1	32.2	29.7	27.5	0.09
950925	0400	1.53	0.132	0.142	7.56	7.04	4.0	6.0	10.1	32.6	30.7	31.1	0.10
950925	0700	1.45	0.152	0.132	6.59	7.56	10.0	8.0	17.0	35.8	32.6	29.7	0.12
950925	1000	1.32	0.132	0.132	7.56	7.56	12.0	8.0	18.2	36.8	32.8	29.2	0.11
950925	1300	1.25	0.132	0.142	7.56	7.04	-4.0	0.0	10.8	35.6	32.4	29.5	0.09
950925	1600	1.20	0.152	0.113	6.59	8.87	6.0	6.0	9.6	31.9	32.2	24.9	0.10
950925	1900	1.15	0.113	0.123	8.87	8.16	2.0	4.0	14.0	33.8	33.6	25.1	0.11
950925	2200	1.05	0.142	0.113	7.04	8.87	8.0	8.0	13.0	31.1	29.6	24.6	0.11
950926	0100	1.04	0.113	0.113	8.87	8.87	4.0	8.0	11.3	28.2	28.1	20.8	0.11
950926	0400	1.07	0.113	0.113	8.87	8.87	6.0	6.0	6.3	27.1	27.7	20.5	0.12
950926	0700	0.99	0.113	0.113	8.87	8.87	0.0	6.0	8.4	28.3	29.0	20.4	0.14
950926	1000	0.91	0.113	0.103	8.87	9.71	8.0	8.0	9.6	27.8	27.9	22.9	0.13
950926	1300	0.89	0.103	0.103	9.71	9.71	0.0	0.0	5.4	25.8	25.6	20.2	0.11
950926	1600	0.95	0.103	0.103	9.71	9.71	8.0	4.0	7.0	26.2	26.1	22.7	0.12
950926	1900	0.96	0.113	0.103	8.87	9.71	2.0	2.0	-0.2	27.0	26.4	21.2	0.18
950926	2200	0.85	0.103	0.103	9.71	9.71	6.0	4.0	7.4	26.1	26.0	19.1	0.16
950927	0100	0.78	0.113	0.103	8.87	9.71	-16.0	4.0	1.3	28.4	26.9	26.0	0.13
950927	0400	0.79	0.103	0.103	9.71	9.71	6.0	4.0	9.5	31.7	27.7	24.3	0.14
950927	0700	0.94	0.113	0.103	8.87	9.71	2.0	50.0	24.6	39.4	24.5	24.5	0.21
950927	1000	0.84	0.093	0.103	10.72	9.71	4.0	4.0	20.2	36.9	24.6	22.4	0.15
950927	1300	0.78	0.113	0.103	8.87	9.71	-2.0	2.0	19.1	36.9	24.9	24.9	0.14
950927	1600	0.79	0.113	0.113	8.87	8.87	2.0	-2.0	13.1	36.9	27.1	26.1	0.14
950927	1900	0.74	0.103	0.113	9.71	8.87	0.0	0.0	9.7	37.2	29.9	32.7	0.13
950927	2200	0.70	0.113	0.103	8.87	9.71	6.0	6.0	9.9	34.0	30.2	24.2	0.15
950928	0100	0.67	0.103	0.103	9.71	9.71	4.0	4.0	9.4	30.0	27.9	20.3	0.13
950928	0400	0.63	0.113	0.113	8.87	8.87	2.0	6.0	9.3	30.2	29.2	23.1	0.13
950928	0700	0.70	0.113	0.113	8.87	8.87	6.0	6.0	13.3	34.7	31.7	27.4	0.12
950928	1000	0.78	0.113	0.269	8.87	3.72	-2.0	16.0	13.3	43.1	35.3	33.1	0.13
950928	1300	0.72	0.103	0.103	9.71	9.71	-12.0	-10.0	12.0	45.5	34.9	22.7	0.12
950928	1600	0.65	0.113	0.113	8.87	8.87	-4.0	-4.0	3.4	37.8	36.6	23.1	0.11
950928	1900	0.67	0.298	0.113	3.35	8.87	50.0	-32.0	-1.0	48.2	37.8	33.4	0.12
950928	2200	0.92	0.240	0.259	4.17	3.86	22.0	32.0	18.0	49.1	30.8	34.4	0.16
950929	0100	1.20	0.201	0.201	4.98	4.98	42.0	42.0	26.8	39.5	31.1	28.3	0.12
950929	0400	1.47	0.181	0.181	5.52	5.52	38.0	36.0	23.6	37.0	30.7	27.4	0.11
950929	0700	1.68	0.171	0.171	5.83	5.83	36.0	36.0	24.7	42.6	37.7	35.7	0.09
950929	1000	1.71	0.162	0.162	6.19	6.19	16.0	2.0	21.5	37.2	31.2	28.2	0.13
950929	1300	1.68	0.171	0.171	5.83	5.83	36.0	14.0	26.1	35.5	28.3	28.5	0.16
950929	1600	1.88	0.152	0.142	6.59	7.04	14.0	16.0	19.7	38.0	28.4	26.3	0.13
950929	1900	2.14	0.113	0.123	8.87	8.16	0.0	0.0	13.7	42.3	34.7	26.4	0.12
950929	2200	2.14	0.113	0.113	8.87	8.87	0.0	2.0	15.2	36.5	34.1	26.1	0.11
950930	0100	2.02	0.103	0.103	9.71	9.71	-2.0	-2.0	13.1	37.8	31.5	24.5	0.12
950930	0400	2.27	0.113	0.113	8.87	8.87	-10.0	-8.0	10.2	37.7	30.0	24.4	0.11
950930	0700	2.18	0.103	0.103	9.71	9.71	-12.0	-10.0	10.9	37.6	30.1	22.6	0.11
950930	1000	2.08	0.103	0.103	9.71	9.71	-2.0	2.0	16.1	38.4	29.5	21.0	0.13
950930	1300	1.90	0.103	0.103	9.71	9.71	2.0	2.0	15.6	37.1	29.1	22.1	0.12
950930	1600	1.89	0.103	0.103	9.71	9.71	4.0	4.0	17.1	34.8	27.3	22.4	0.11
950930	1900	1.89	0.093	0.093	10.72	10.72	0.0	2.0	13.5	31.0	28.0	15.4	0.11
950930	2200	1.70	0.093	0.093	10.72	10.72	6.0	4.0	13.2	27.6	25.8	14.7	0.11
951001	0100	1.62	0.093	0.093	10.72	10.72	8.0	2.0	10.2	28.6	26.0	18.7	0.12
951001	0400	1.66	0.093	0.093	10.72	10.72	8.0	4.0	9.9	26.5	24.9	19.6	0.10
951001	0700	1.64	0.103	0.103	9.71	9.71	6.0	2.0	9.4	25.4	23.9	16.6	0.10
951001	1000	1.56	0.093	0.093	10.72	10.72	10.0	8.0	10.7	24.3	23.7	18.5	0.12
951001	1300	1.36	0.093	0.093	10.72	10.72	8.0	4.0	8.1	23.4	23.5	15.9	0.12
951001	1600	1.23	0.093	0.093	10.72	10.72	6.0	10.0	8.2	24.2	24.3	21.1	0.11

Appendix A   Table of Collection Times and Bulk Parameters

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
951001	1900	1.25	0.093	0.093	10.72	10.72	6.0	4.0	6.0	22.5	23.0	18.0	0.10
951001	2200	1.29	0.093	0.093	10.72	10.72	8.0	2.0	3.6	21.2	21.6	18.4	0.11
951002	0100	1.20	0.093	0.093	10.72	10.72	8.0	6.0	3.0	22.3	22.1	17.5	0.12
951002	0400	1.15	0.093	0.093	10.72	10.72	8.0	4.0	3.3	21.3	20.7	16.7	0.13
951002	0700	1.09	0.093	0.093	10.72	10.72	6.0	2.0	-0.8	21.3	21.2	18.1	0.11
951002	1000	0.96	0.103	0.103	9.71	9.71	8.0	8.0	2.9	23.2	23.2	18.5	0.12
951002	1300	0.80	0.103	0.103	9.71	9.71	10.0	8.0	4.9	24.8	24.8	17.1	0.14
951002	1600	0.73	0.103	0.103	9.71	9.71	10.0	6.0	2.7	24.9	26.5	21.3	0.15
951002	1900	0.67	0.103	0.103	9.71	9.71	8.0	2.0	0.5	25.3	25.6	18.2	0.14
951002	2200	0.69	0.103	0.103	9.71	9.71	4.0	4.0	-0.6	25.2	25.1	19.0	0.14
951003	0100	0.67	0.113	0.103	8.87	9.71	6.0	6.0	-2.1	28.4	27.6	18.9	0.17
951003	0400	0.63	0.103	0.103	9.71	9.71	4.0	0.0	-10.3	28.9	28.7	18.7	0.16
951003	0700	0.60	0.103	0.103	9.71	9.71	6.0	4.0	-6.2	28.1	27.1	17.5	0.14
951003	1000	0.62	0.113	0.113	8.87	8.87	4.0	4.0	-9.3	29.4	23.9	16.0	0.15
951003	1300	0.60	0.103	0.113	9.71	8.87	6.0	-2.0	-11.6	33.0	26.5	20.9	0.22
951003	1600	0.59	0.093	0.093	10.72	10.72	-30.0	-2.0	-7.4	33.8	29.6	31.1	0.22
951003	1900	0.59	0.103	0.093	9.71	10.72	-2.0	-8.0	-7.5	29.0	26.5	28.2	0.21
951003	2200	0.59	0.093	0.093	10.72	10.72	-30.0	-6.0	-8.7	31.5	27.7	24.3	0.27
951004	0100	0.60	0.093	0.093	10.72	10.72	-6.0	-6.0	-7.5	37.2	30.8	30.5	0.21
951004	0400	0.62	0.054	0.054	18.45	18.45	2.0	-34.0	-25.9	38.0	29.0	19.2	0.25
951004	0700	0.61	0.054	0.093	18.45	10.72	-6.0	-6.0	-25.2	35.8	28.4	30.1	0.24
951004	1000	0.70	0.103	0.103	9.71	9.71	-28.0	-28.0	-25.4	36.2	25.5	27.1	0.21
951004	1300	0.90	0.191	0.181	5.24	5.52	-48.0	-46.0	-35.4	32.1	23.0	17.9	0.19
951004	1600	0.99	0.152	0.152	6.59	6.59	-42.0	-44.0	-33.7	26.9	20.9	16.6	0.16
951004	1900	0.82	0.152	0.142	6.59	7.04	-44.0	-44.0	-34.6	30.9	24.0	21.7	0.16
951004	2200	0.77	0.142	0.152	7.04	6.59	-38.0	-28.0	-34.0	32.2	26.8	22.4	0.15
951005	0100	0.78	0.064	0.152	15.63	6.59	-2.0	-48.0	-29.7	34.6	26.2	26.4	0.18
951005	0400	0.76	0.162	0.152	6.19	6.59	-46.0	-48.0	-30.0	35.5	24.3	24.5	0.18
951005	0700	0.79	0.152	0.152	6.59	6.59	-44.0	-48.0	-35.2	33.9	22.2	24.3	0.17
951005	1000	0.96	0.152	0.152	6.59	6.59	-44.0	-46.0	-39.7	32.5	16.8	15.7	0.28
951005	1300	1.06	0.279	0.152	3.59	6.59	-54.0	-50.0	-42.2	28.7	15.9	18.7	0.33
951005	1600	1.06	0.240	0.142	4.17	7.04	-52.0	-52.0	-40.9	29.7	16.3	21.5	0.29
951005	1900	1.05	0.230	0.142	4.35	7.04	-52.0	-50.0	-41.5	24.9	14.2	16.6	0.26
951005	2200	0.95	0.132	0.093	7.56	10.72	-34.0	-50.0	-36.9	27.7	14.6	22.3	0.19
951006	0100	0.84	0.132	0.142	7.56	7.04	-36.0	-50.0	-37.9	29.2	16.0	16.1	0.21
951006	0400	0.77	0.142	0.142	7.04	7.04	-38.0	-40.0	-35.1	31.7	18.8	15.0	0.19
951006	0700	0.73	0.132	0.093	7.56	10.72	-38.0	-42.0	-36.4	31.8	19.7	26.2	0.20
951006	1000	0.71	0.132	0.152	7.56	6.59	-38.0	-38.0	-35.5	31.0	19.1	13.2	0.14
951006	1300	0.70	0.142	0.103	7.04	9.71	-40.0	-40.0	-35.4	28.5	18.4	21.4	0.18
951006	1600	0.70	0.162	0.103	6.19	9.71	-46.0	-46.0	-37.8	27.2	16.8	23.9	0.21
951006	1900	0.67	0.162	0.093	6.19	10.72	-42.0	-42.0	-36.9	26.9	17.1	28.5	0.20
951006	2200	0.60	0.093	0.093	10.72	10.72	-30.0	-42.0	-36.4	30.7	17.7	28.5	0.17
951007	0100	0.63	0.181	0.083	5.52	11.98	-48.0	-42.0	-39.7	24.3	16.1	21.6	0.23
951007	0400	0.64	0.171	0.103	5.83	9.71	-46.0	-50.0	-39.4	26.9	15.7	22.6	0.20
951007	0700	0.52	0.171	0.103	5.83	9.71	-50.0	-48.0	-35.5	33.2	20.8	20.1	0.22
951007	1000	0.52	0.162	0.093	6.19	10.72	-46.0	-44.0	-36.6	31.8	20.7	27.2	0.18
951007	1300	0.61	0.142	0.083	7.04	11.98	-40.0	-42.0	-34.0	28.6	17.7	24.3	0.20
951007	1600	0.64	0.162	0.083	6.19	11.98	-48.0	-48.0	-40.6	28.0	17.9	28.7	0.20
951007	1900	0.57	0.103	0.083	9.71	11.98	-28.0	-44.0	-39.9	30.9	17.5	22.8	0.20
951007	2200	0.51	0.093	0.093	10.72	10.72	-30.0	-32.0	-35.3	36.1	22.0	27.5	0.19
951008	0100	0.48	0.162	0.093	6.19	10.72	-48.0	-48.0	-36.6	42.9	30.5	25.3	0.19
951008	0400	0.53	0.103	0.093	9.71	10.72	-32.0	-30.0	-14.7	62.8	43.0	36.2	0.22
951008	0700	1.08	0.220	0.220	4.54	4.54	52.0	56.0	44.6	23.5	20.4	10.2	0.26

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
951008	1000	1.24	0.181	0.181	5.52	5.52	44.0	44.0	41.4	21.6	20.0	10.3	0.21
951008	1300	1.07	0.181	0.181	5.52	5.52	34.0	36.0	32.8	29.2	24.4	15.2	0.18
951008	1600	0.97	0.181	0.181	5.52	5.52	34.0	36.0	23.4	33.7	28.7	16.6	0.16
951008	1900	0.86	0.181	0.181	5.52	5.52	38.0	38.0	26.2	40.9	27.7	16.6	0.17
951008	2200	0.89	0.181	0.269	5.52	3.72	32.0	38.0	27.9	40.8	25.7	21.6	0.18
951009	0100	0.87	0.191	0.220	5.24	4.54	32.0	38.0	24.3	44.1	25.7	19.9	0.15
951009	0400	0.88	0.201	0.113	4.98	8.87	34.0	34.0	22.5	48.7	31.8	31.4	0.14
951009	0700	0.97	0.220	0.230	4.54	4.35	24.0	28.0	18.9	44.1	32.7	27.3	0.14
951009	1000	0.94	0.230	0.220	4.35	4.54	44.0	42.0	20.1	47.0	32.6	27.5	0.12
951009	1300	0.89	0.220	0.103	4.54	9.71	38.0	2.0	14.3	48.8	35.1	28.9	0.11
951009	1600	0.87	0.220	0.103	4.54	9.71	38.0	18.0	9.9	50.8	37.9	32.2	0.12
951009	1900	0.96	0.220	0.220	4.54	4.54	36.0	32.0	13.8	47.2	39.0	38.4	0.12
951009	2200	1.04	0.220	0.220	4.54	4.54	12.0	10.0	6.0	40.7	31.9	21.3	0.10
951010	0100	1.08	0.201	0.201	4.98	4.98	12.0	12.0	6.1	42.3	32.7	33.2	0.10
951010	0400	1.32	0.191	0.191	5.24	5.24	8.0	4.0	14.4	37.0	32.9	24.6	0.10
951010	0700	1.44	0.181	0.181	5.52	5.52	14.0	10.0	14.0	35.0	29.9	24.1	0.11
951010	1000	1.39	0.171	0.171	5.83	5.83	8.0	6.0	11.6	29.6	26.5	17.7	0.09
951010	1300	1.28	0.162	0.162	6.19	6.19	6.0	8.0	8.4	30.9	28.0	18.9	0.09
951010	1600	1.26	0.171	0.162	5.83	6.19	2.0	2.0	6.3	35.3	31.9	29.6	0.10
951010	1900	1.27	0.171	0.162	5.83	6.19	-2.0	2.0	-5.2	42.2	31.3	37.1	0.11
951010	2200	1.17	0.152	0.142	6.59	7.04	-40.0	-40.0	-6.9	45.7	35.2	21.1	0.11
951011	0100	1.15	0.142	0.142	7.04	7.04	-32.0	-32.0	-3.5	48.0	32.8	19.9	0.11
951011	0400	1.30	0.132	0.132	7.56	7.56	-34.0	-32.0	-0.2	52.9	30.8	25.3	0.12
951011	0700	1.59	0.210	0.210	4.75	4.75	40.0	46.0	19.9	57.7	29.6	22.5	0.18
951011	1000	1.55	0.132	0.191	7.56	5.24	-30.0	32.0	10.4	58.9	28.4	28.8	0.16
951011	1300	1.37	0.142	0.142	7.04	7.04	-32.0	-32.0	4.6	51.2	27.6	15.3	0.12
951011	1600	1.41	0.162	0.201	6.19	4.98	-14.0	-8.0	12.4	48.0	28.4	34.8	0.14
951011	1900	1.53	0.181	0.181	5.52	5.52	-2.0	-8.0	14.2	45.6	30.5	32.8	0.14
951011	2200	1.30	0.191	0.181	5.24	5.52	30.0	28.0	16.9	42.9	31.2	27.9	0.13
951012	0100	1.20	0.181	0.181	5.52	5.52	8.0	-4.0	9.3	40.0	28.2	20.4	0.12
951012	0400	1.12	0.093	0.093	10.72	10.72	-6.0	-4.0	8.7	39.5	30.0	26.2	0.10
951012	0700	1.09	0.093	0.093	10.72	10.72	-6.0	-4.0	10.3	40.9	31.2	26.2	0.11
951012	1000	1.03	0.191	0.201	5.24	4.98	8.0	4.0	5.8	37.0	30.7	26.8	0.11
951012	1300	0.94	0.103	0.093	9.71	10.72	-28.0	4.0	3.6	38.2	31.6	29.8	0.10
951012	1600	0.84	0.103	0.103	9.71	9.71	-8.0	-6.0	0.8	32.2	29.7	24.8	0.10
951012	1900	0.76	0.093	0.103	10.72	9.71	4.0	-2.0	-3.4	30.8	29.9	32.6	0.12
951012	2200	0.69	0.103	0.103	9.71	9.71	-6.0	-2.0	-4.7	34.3	31.4	30.0	0.14
951013	0100	0.68	0.103	0.103	9.71	9.71	2.0	2.0	-3.6	31.4	30.0	27.8	0.12
951013	0400	0.64	0.093	0.103	10.72	9.71	2.0	-12.0	-9.3	30.6	29.7	30.6	0.15
951013	0700	0.64	0.103	0.103	9.71	9.71	-28.0	-8.0	-15.0	31.4	29.9	31.3	0.14
951013	1000	0.63	0.103	0.103	9.71	9.71	-6.0	-8.0	-12.4	31.7	29.9	25.7	0.16
951013	1300	0.60	0.093	0.103	10.72	9.71	4.0	-2.0	-13.4	32.1	30.8	27.4	0.17
951013	1600	0.63	0.083	0.083	11.98	11.98	0.0	-2.0	-14.2	31.5	29.1	24.4	0.15
951013	1900	0.65	0.083	0.083	11.98	11.98	-2.0	0.0	-17.6	32.0	28.7	20.9	0.14
951013	2200	0.65	0.074	0.074	13.56	13.56	-4.0	-4.0	-12.6	31.2	29.6	26.7	0.17
951014	0100	0.65	0.083	0.083	11.98	11.98	-2.0	-4.0	-14.6	30.6	27.4	22.9	0.16
951014	0400	0.63	0.083	0.083	11.98	11.98	2.0	-2.0	-11.6	30.4	25.3	23.4	0.16
951014	0700	0.67	0.083	0.083	11.98	11.98	4.0	-10.0	-18.4	38.3	25.9	26.2	0.19
951014	1000	0.78	0.083	0.083	11.98	11.98	4.0	-52.0	-29.2	44.7	22.0	22.8	0.24
951014	1300	0.79	0.083	0.083	11.98	11.98	6.0	-50.0	-30.2	41.1	19.9	26.5	0.18
951014	1600	0.85	0.162	0.083	6.19	11.98	-42.0	-44.0	-36.2	28.8	17.6	28.7	0.16
951014	1900	0.86	0.152	0.152	6.59	6.59	-40.0	-48.0	-36.0	27.4	18.0	12.4	0.18
951014	2200	0.88	0.152	0.152	6.59	6.59	-44.0	-46.0	-38.1	24.9	17.1	16.7	0.18

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
951015	0100	0.76	0.142	0.142	7.04	7.04	-44.0	-42.0	-20.7	38.0	28.5	11.7	0.18
951015	0400	0.88	0.132	0.123	7.56	8.16	-40.0	52.0	18.9	85.3	20.7	15.2	0.16
951015	0700	0.98	0.220	0.201	4.54	4.98	50.0	50.0	23.8	65.6	20.0	13.5	0.21
951015	1000	1.18	0.191	0.181	5.24	5.52	32.0	32.0	26.7	39.1	22.1	14.7	0.17
951015	1300	1.16	0.162	0.162	6.19	6.19	18.0	20.0	23.3	33.9	24.2	16.9	0.17
951015	1600	1.02	0.162	0.162	6.19	6.19	18.0	20.0	22.8	39.9	24.7	17.3	0.14
951015	1900	0.92	0.162	0.162	6.19	6.19	32.0	28.0	17.7	51.2	22.8	16.0	0.12
951015	2200	0.77	0.113	0.113	8.87	8.87	-34.0	32.0	12.1	56.2	20.9	19.1	0.13
951016	0100	0.67	0.113	0.113	8.87	8.87	-36.0	-34.0	12.0	69.7	19.2	22.9	0.20
951016	0400	0.73	0.103	0.103	9.71	9.71	-30.0	-34.0	-2.9	70.0	20.2	18.7	0.17
951016	0700	0.70	0.103	0.103	9.71	9.71	-34.0	-34.0	-3.9	61.6	21.1	21.7	0.16
951016	1000	0.87	0.103	0.103	9.71	9.71	-32.0	-32.0	11.5	64.2	21.7	24.9	0.14
951016	1300	0.76	0.103	0.103	9.71	9.71	-34.0	-34.0	8.5	62.6	23.3	24.9	0.16
951016	1600	0.64	0.113	0.103	8.87	9.71	-34.0	-34.0	7.8	64.6	26.2	27.8	0.16
951016	1900	0.59	0.113	0.113	8.87	8.87	-36.0	-34.0	7.4	62.6	26.1	23.1	0.14
951016	2200	0.55	0.123	0.113	8.16	8.87	-34.0	-34.0	10.6	63.4	26.1	26.9	0.17
951017	0100	0.53	0.074	0.074	13.56	13.56	-8.0	-8.0	3.1	50.0	24.4	15.1	0.17
951017	0400	0.88	0.210	0.230	4.75	4.35	32.0	38.0	31.8	37.2	22.1	20.7	0.16
951017	0700	1.01	0.181	0.181	5.52	5.52	34.0	34.0	34.6	31.0	22.4	16.0	0.14
951017	1000	1.01	0.171	0.171	5.83	5.83	36.0	26.0	32.2	30.7	24.0	13.1	0.15
951017	1300	0.91	0.162	0.162	6.19	6.19	26.0	26.0	29.1	32.7	26.5	14.5	0.16
951017	1600	0.78	0.181	0.181	5.52	5.52	34.0	30.0	27.8	44.3	28.0	14.2	0.16
951017	1900	0.73	0.083	0.083	11.98	11.98	-4.0	30.0	22.8	44.2	29.2	19.9	0.16
951017	2200	0.68	0.083	0.083	11.98	11.98	-6.0	-6.0	20.2	44.7	30.9	18.1	0.15
951018	0100	0.65	0.171	0.074	5.83	13.56	18.0	16.0	17.5	38.7	30.4	19.0	0.16
951018	0400	0.60	0.083	0.083	11.98	11.98	-4.0	20.0	7.8	39.0	30.7	17.5	0.16
951018	0700	0.57	0.083	0.074	11.98	13.56	-4.0	-12.0	9.3	39.5	35.1	24.3	0.15
951018	1000	0.57	0.083	0.083	11.98	11.98	-4.0	-6.0	-0.4	36.4	36.1	21.4	0.17
951018	1300	0.54	0.083	0.083	11.98	11.98	-2.0	-8.0	-8.5	35.3	34.3	20.2	0.18
951018	1600	0.52	0.074	0.074	13.56	13.56	-10.0	-10.0	-15.0	34.4	35.8	21.1	0.19
951018	1900	0.53	0.074	0.074	13.56	13.56	-14.0	-12.0	-18.6	32.9	31.9	22.2	0.18
951018	2200	0.56	0.074	0.074	13.56	13.56	0.0	-2.0	-15.1	30.7	30.4	24.5	0.18
951019	0100	0.56	0.074	0.074	13.56	13.56	2.0	-2.0	-14.0	34.2	31.8	21.4	0.22
951019	0400	0.55	0.074	0.074	13.56	13.56	-14.0	-12.0	-20.5	35.5	32.3	25.6	0.21
951019	0700	0.57	0.074	0.074	13.56	13.56	-2.0	-2.0	-17.7	34.8	29.1	19.0	0.16
951019	1000	0.73	0.074	0.074	13.56	13.56	2.0	2.0	-2.9	44.2	27.9	20.2	0.13
951019	1300	0.86	0.074	0.074	13.56	13.56	-10.0	0.0	-10.6	37.8	27.8	22.3	0.11
951019	1600	1.05	0.210	0.210	4.75	4.75	-14.0	-16.0	-12.0	35.0	26.2	24.2	0.09
951019	1900	1.05	0.132	0.142	7.56	7.04	-34.0	-34.0	-6.6	38.6	29.7	19.2	0.09
951019	2200	1.00	0.142	0.142	7.04	7.04	-28.0	-34.0	-9.5	40.0	30.3	17.8	0.10
951020	0100	0.94	0.142	0.142	7.04	7.04	-36.0	-34.0	-14.1	41.7	34.0	16.1	0.12
951020	0400	0.88	0.142	0.132	7.04	7.56	-36.0	-34.0	-14.2	40.2	34.7	19.4	0.13
951020	0700	0.77	0.142	0.142	7.04	7.04	-30.0	-30.0	-15.6	39.1	35.2	19.9	0.12
951020	1000	0.85	0.142	0.142	7.04	7.04	-32.0	-26.0	-18.6	32.8	31.9	20.5	0.11
951020	1300	1.01	0.162	0.152	6.19	6.59	-18.0	-18.0	-19.0	29.8	28.9	23.2	0.12
951020	1600	1.18	0.132	0.142	7.56	7.04	-30.0	-26.0	-20.4	26.3	27.0	24.6	0.12
951020	1900	1.26	0.142	0.132	7.04	7.56	-14.0	-16.0	-24.0	27.0	28.3	24.0	0.11
951020	2200	1.65	0.132	0.132	7.56	7.56	-12.0	-12.0	-31.6	25.5	25.4	21.3	0.15
951021	0100	1.80	0.123	0.123	8.16	8.16	-30.0	-14.0	-32.8	26.9	25.1	21.7	0.19
951021	0400	1.90	0.123	0.123	8.16	8.16	-16.0	-34.0	-35.9	28.8	25.0	24.5	0.21
951021	0700	1.61	0.113	0.113	8.87	8.87	-14.0	-34.0	-27.4	28.6	28.5	24.1	0.13
951021	1000	1.57	0.113	0.113	8.87	8.87	-8.0	-10.0	-11.8	28.9	28.3	22.8	0.07
951021	1300	1.55	0.113	0.113	8.87	8.87	-2.0	-2.0	-4.8	31.9	30.2	28.0	0.09
951021	1600	1.35	0.113	0.113	8.87	8.87	-32.0	-12.0	-11.3	34.1	29.2	27.6	0.11

(Sheet 8 of 54)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	x
951021	1900	1.04	0.113	0.113	8.87	8.87	-10.0	-8.0	-4.6	35.0	26.9	21.7	0.11
951021	2200	1.01	0.113	0.113	8.87	8.87	-2.0	-2.0	-2.1	32.3	29.0	27.0	0.09
951022	0100	1.04	0.103	0.103	9.71	9.71	2.0	0.0	-4.6	29.8	26.5	25.3	0.10
951022	0400	1.15	0.083	0.083	11.98	11.98	20.0	0.0	-0.4	31.4	28.7	30.2	0.18
951022	0700	1.22	0.103	0.093	9.71	10.72	-4.0	-2.0	0.1	30.7	27.4	32.1	0.12
951022	1000	1.24	0.093	0.093	10.72	10.72	-2.0	-4.0	-7.8	30.3	26.7	27.7	0.08
951022	1300	1.15	0.093	0.103	10.72	9.71	16.0	8.0	1.6	31.1	26.2	26.8	0.09
951022	1600	1.05	0.103	0.103	9.71	9.71	6.0	-6.0	-5.3	34.0	29.5	29.9	0.14
951022	1900	0.97	0.103	0.103	9.71	9.71	-4.0	0.0	-9.7	33.6	30.1	33.5	0.14
951022	2200	0.97	0.103	0.103	9.71	9.71	-4.0	-6.0	-0.9	31.3	28.0	30.1	0.08
951023	0100	1.02	0.103	0.103	9.71	9.71	2.0	-6.0	-2.8	29.6	27.8	28.8	0.11
951023	0400	1.04	0.093	0.093	10.72	10.72	14.0	-10.0	-9.9	33.5	28.6	31.0	0.14
951023	0700	1.03	0.093	0.093	10.72	10.72	2.0	-2.0	-10.5	32.7	28.8	28.2	0.14
951023	1000	0.98	0.103	0.103	9.71	9.71	2.0	-6.0	-5.3	30.8	27.7	25.7	0.09
951023	1300	0.95	0.113	0.103	8.87	9.71	-6.0	-6.0	-6.6	30.6	28.9	33.8	0.10
951023	1600	0.92	0.103	0.103	9.71	9.71	0.0	-28.0	-14.9	32.4	29.0	28.8	0.14
951023	1900	0.86	0.103	0.103	9.71	9.71	-28.0	0.0	-16.5	33.1	31.2	32.1	0.16
951023	2200	0.82	0.103	0.103	9.71	9.71	-4.0	-4.0	-15.5	30.4	29.6	29.1	0.11
951024	0100	0.86	0.113	0.113	8.87	8.87	-28.0	-6.0	-18.7	30.2	29.8	30.7	0.12
951024	0400	0.86	0.123	0.113	8.16	8.87	-24.0	-22.0	-16.7	29.3	27.7	27.5	0.15
951024	0700	0.85	0.103	0.103	9.71	9.71	-26.0	-26.0	-22.6	33.2	30.7	27.8	0.18
951024	1000	0.75	0.113	0.103	8.87	9.71	-34.0	-28.0	-21.9	33.5	30.7	32.2	0.14
951024	1300	0.75	0.113	0.113	8.87	8.87	-32.0	-32.0	-23.3	34.3	29.1	26.9	0.12
951024	1600	0.80	0.103	0.103	9.71	9.71	-6.0	-6.0	-21.6	32.4	28.5	27.1	0.17
951024	1900	0.76	0.103	0.103	9.71	9.71	0.0	-28.0	-19.7	34.9	28.9	30.3	0.19
951024	2200	0.75	0.103	0.093	9.71	10.72	-6.0	-28.0	-16.4	32.5	28.6	34.5	0.15
951025	0100	0.73	0.103	0.103	9.71	9.71	-4.0	-32.0	-16.9	33.7	28.7	30.8	0.12
951025	0400	0.74	0.093	0.103	10.72	9.71	-30.0	-32.0	-23.5	32.4	27.9	35.9	0.18
951025	0700	0.73	0.093	0.103	10.72	9.71	-4.0	-32.0	-10.5	38.5	31.4	36.5	0.23
951025	1000	1.11	0.210	0.210	4.75	4.75	48.0	54.0	32.3	56.3	23.3	13.7	0.17
951025	1300	1.13	0.171	0.171	5.83	5.83	40.0	42.0	23.8	50.9	22.7	13.4	0.13
951025	1600	1.04	0.181	0.181	5.52	5.52	40.0	38.0	18.7	52.1	25.4	12.2	0.14
951025	1900	1.10	0.181	0.103	5.52	9.71	38.0	38.0	18.1	50.8	28.1	28.1	0.13
951025	2200	0.92	0.103	0.103	9.71	9.71	-12.0	34.0	13.5	51.8	30.1	23.9	0.12
951026	0100	0.85	0.103	0.103	9.71	9.71	-32.0	-10.0	6.2	48.3	31.6	27.1	0.10
951026	0400	0.84	0.103	0.103	9.71	9.71	-30.0	-32.0	-2.4	48.0	34.2	27.3	0.12
951026	0700	0.84	0.113	0.103	8.87	9.71	-32.0	-8.0	-1.8	49.2	36.4	31.0	0.17
951026	1000	0.82	0.103	0.103	9.71	9.71	-34.0	-8.0	4.0	48.9	33.4	28.6	0.16
951026	1300	0.78	0.054	0.103	18.45	9.71	-12.0	-12.0	-4.7	36.6	29.3	29.2	0.13
951026	1600	0.77	0.113	0.113	8.87	8.87	-30.0	-10.0	-8.7	37.3	29.9	20.4	0.16
951026	1900	0.75	0.113	0.113	8.87	8.87	-34.0	-8.0	-9.3	39.1	32.0	27.0	0.18
951026	2200	0.70	0.054	0.113	18.45	8.87	-6.0	-8.0	-12.8	37.0	32.6	30.4	0.17
951027	0100	0.72	0.054	0.113	18.45	8.87	-6.0	-8.0	-14.3	30.5	29.0	28.3	0.13
951027	0400	0.71	0.113	0.113	8.87	8.87	-30.0	-32.0	-18.8	32.3	32.5	22.5	0.14
951027	0700	0.77	0.113	0.113	8.87	8.87	-32.0	-10.0	-22.4	32.4	32.3	28.0	0.18
951027	1000	0.73	0.064	0.113	15.63	8.87	0.0	-12.0	-20.7	32.9	30.4	26.5	0.21
951027	1300	0.67	0.064	0.064	15.63	15.63	-6.0	-10.0	-18.6	31.6	27.3	19.0	0.16
951027	1600	0.72	0.308	0.113	3.25	8.87	-62.0	-6.0	-28.5	36.1	25.6	27.1	0.20
951027	1900	0.87	0.230	0.064	4.35	15.63	-52.0	-52.0	-41.0	37.0	22.7	21.3	0.22
951027	2200	0.89	0.123	0.123	8.16	8.16	-34.0	-48.0	-37.5	34.4	18.4	17.4	0.21
951028	0100	0.95	0.171	0.123	5.83	8.16	-44.0	-44.0	-40.3	26.1	15.3	17.7	0.21
951028	0400	0.98	0.142	0.123	7.04	8.16	-38.0	-40.0	-37.9	26.9	14.7	16.6	0.18
951028	0700	1.11	0.132	0.142	7.56	7.04	-36.0	-50.0	-39.8	22.4	13.9	11.4	0.23

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{JDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
951028	1000	0.86	0.113	0.113	8.87	8.87	-34.0	-38.0	-38.0	23.7	15.1	15.8	0.20
951028	1300	0.73	0.113	0.064	8.87	15.63	-36.0	-36.0	-31.6	28.4	17.6	20.0	0.17
951028	1600	0.72	0.064	0.064	15.63	15.63	-8.0	-36.0	-24.0	29.8	21.1	13.4	0.12
951028	1900	0.74	0.113	0.113	8.87	8.87	-34.0	-36.0	-23.1	31.2	25.7	20.9	0.19
951028	2200	0.80	0.064	0.064	15.63	15.63	-10.0	-12.0	-6.4	50.4	20.0	13.9	0.27
951029	0100	0.72	0.240	0.064	4.17	15.63	60.0	62.0	15.6	77.3	19.0	22.9	0.24
951029	0400	0.74	0.064	0.064	15.63	15.63	-6.0	60.0	21.0	69.4	16.6	16.8	0.21
951029	0700	0.76	0.064	0.064	15.63	15.63	-6.0	62.0	26.2	70.9	19.2	16.2	0.19
951029	1000	0.75	0.064	0.093	15.63	10.72	-10.0	62.0	15.5	74.8	22.3	24.6	0.28
951029	1300	0.67	0.064	0.083	15.63	11.98	-8.0	-8.0	12.3	68.1	25.4	32.7	0.27
951029	1600	0.63	0.064	0.093	15.63	10.72	-8.0	-6.0	11.9	52.8	25.6	34.2	0.15
951029	1900	0.65	0.064	0.093	15.63	10.72	-12.0	-10.0	12.6	65.4	23.7	27.9	0.19
951029	2200	0.81	0.064	0.064	15.63	15.63	-10.0	52.0	22.8	63.3	20.2	18.3	0.20
951030	0100	1.27	0.162	0.171	6.19	5.83	36.0	38.0	33.5	29.0	15.7	11.6	0.18
951030	0400	1.29	0.171	0.162	5.83	6.19	36.0	36.0	27.2	35.2	17.7	14.1	0.15
951030	0700	1.14	0.181	0.083	5.52	11.98	42.0	40.0	21.6	47.5	18.2	17.5	0.11
951030	1000	1.16	0.083	0.083	11.98	11.98	-10.0	24.0	16.4	45.2	21.0	16.5	0.13
951030	1300	1.01	0.083	0.083	11.98	11.98	-6.0	28.0	16.1	43.3	21.3	19.9	0.12
951030	1600	0.93	0.074	0.083	13.56	11.98	-22.0	-8.0	8.9	45.8	21.6	25.2	0.10
951030	1900	1.00	0.074	0.083	13.56	11.98	-20.0	-10.0	1.9	38.6	20.5	20.1	0.09
951030	2200	0.87	0.074	0.083	13.56	11.98	-20.0	-6.0	-2.9	32.6	21.7	23.1	0.13
951031	0100	0.77	0.074	0.083	13.56	11.98	-14.0	-12.0	-2.1	26.3	22.5	24.1	0.15
951031	0400	0.74	0.064	0.083	15.63	11.98	-8.0	-8.0	-6.0	24.2	25.0	27.8	0.12
951031	0700	0.85	0.074	0.074	13.56	13.56	-10.0	-10.0	-9.3	19.2	20.4	15.6	0.09
951031	1000	0.84	0.074	0.074	13.56	13.56	-12.0	-10.0	-8.4	20.6	21.0	14.1	0.12
951031	1300	0.84	0.074	0.074	13.56	13.56	-16.0	-14.0	-15.2	19.8	20.0	13.4	0.17
951031	1600	0.78	0.074	0.074	13.56	13.56	-18.0	-18.0	-17.3	22.6	21.3	18.2	0.14
951031	1900	0.85	0.074	0.074	13.56	13.56	-14.0	-10.0	-15.4	24.2	20.9	19.3	0.09
951031	2200	0.88	0.074	0.074	13.56	13.56	-12.0	-8.0	-12.5	24.5	22.4	18.2	0.12
951101	0100	0.83	0.074	0.074	13.56	13.56	-18.0	-18.0	-16.1	26.6	24.5	20.4	0.22
951101	0400	0.79	0.083	0.083	11.98	11.98	-4.0	-6.0	-15.9	29.4	26.2	26.0	0.15
951101	0700	0.74	0.083	0.083	11.98	11.98	-4.0	-6.0	-18.9	32.3	23.4	23.4	0.11
951101	1000	0.69	0.083	0.083	11.98	11.98	-4.0	-56.0	-26.1	43.3	23.2	24.6	0.14
951101	1300	0.67	0.074	0.074	13.56	13.56	2.0	-52.0	-28.5	48.4	23.5	18.7	0.20
951101	1600	0.68	0.181	0.074	5.52	13.56	-52.0	-50.0	-31.8	43.7	20.9	22.8	0.17
951101	1900	0.67	0.142	0.074	7.04	13.56	-42.0	-48.0	-30.2	41.9	22.6	17.6	0.11
951101	2200	0.70	0.152	0.083	6.59	11.98	-46.0	-46.0	-33.5	39.4	21.2	20.5	0.16
951102	0100	0.73	0.162	0.162	6.19	6.19	-50.0	-50.0	-40.9	34.3	21.1	11.0	0.14
951102	0400	0.82	0.142	0.152	7.04	6.59	-46.0	-48.0	-43.2	27.0	20.8	16.9	0.14
951102	0700	0.74	0.142	0.142	7.04	7.04	-42.0	-44.0	-43.7	24.9	19.6	10.6	0.13
951102	1000	0.70	0.152	0.152	6.59	6.59	-46.0	-46.0	-43.0	23.6	18.9	12.5	0.13
951102	1300	0.73	0.142	0.142	7.04	7.04	-42.0	-44.0	-42.2	18.4	16.3	12.5	0.16
951102	1600	0.75	0.142	0.142	7.04	7.04	-44.0	-44.0	-41.5	17.5	17.2	13.4	0.16
951102	1900	0.70	0.142	0.142	7.04	7.04	-28.0	-38.0	-36.7	16.9	16.3	13.7	0.13
951102	2200	0.74	0.152	0.132	6.59	7.56	-42.0	-40.0	-39.8	16.8	16.0	12.7	0.14
951103	0100	0.73	0.123	0.132	8.16	7.56	-34.0	-34.0	-39.4	16.3	15.0	13.2	0.18
951103	0400	0.66	0.123	0.132	8.16	7.56	-34.0	-34.0	-41.8	17.6	16.3	15.6	0.20
951103	0700	0.54	0.132	0.132	7.56	7.56	-38.0	-34.0	-40.8	19.0	17.9	14.7	0.17
951103	1000	0.49	0.142	0.142	7.04	7.04	-40.0	-40.0	-37.6	18.7	16.8	12.3	0.14
951103	1300	0.50	0.142	0.142	7.04	7.04	-40.0	-42.0	-41.0	19.0	16.9	12.8	0.19
951103	1600	0.52	0.132	0.132	7.56	7.56	-42.0	-40.0	-41.6	21.0	18.2	15.2	0.19
951103	1900	0.51	0.142	0.142	7.04	7.04	-42.0	-42.0	-38.6	24.1	20.1	15.0	0.16
951103	2200	0.48	0.132	0.132	7.56	7.56	-36.0	-36.0	-37.7	20.9	19.4	17.6	0.14

(Sheet 10 of 54)

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
951104	0100	1.62	0.171	0.171	5.83	5.83	48.0	54.0	50.6	14.7	13.2	6.8	0.30
951104	0400	1.85	0.152	0.152	6.59	6.59	38.0	42.0	41.1	17.1	12.6	8.8	0.27
951104	0700	1.65	0.142	0.142	7.04	7.04	20.0	40.0	36.5	22.8	15.1	16.4	0.23
951104	1000	1.50	0.162	0.152	6.19	6.59	34.0	34.0	34.5	22.7	16.4	17.3	0.19
951104	1300	1.36	0.152	0.152	6.59	6.59	28.0	28.0	33.6	21.8	16.5	10.9	0.17
951104	1600	1.10	0.162	0.152	6.19	6.59	28.0	28.0	33.8	21.9	18.9	14.2	0.16
951104	1900	0.93	0.152	0.152	6.59	6.59	22.0	40.0	36.0	23.2	17.8	16.9	0.17
951104	2200	0.87	0.171	0.171	5.83	5.83	26.0	42.0	35.4	24.9	16.9	15.0	0.17
951105	0100	1.22	0.162	0.201	6.19	4.98	26.0	48.0	39.5	25.9	15.3	15.2	0.21
951105	0400	1.34	0.162	0.162	6.19	6.19	30.0	30.0	35.7	23.3	16.9	12.6	0.21
951105	0700	1.15	0.152	0.152	6.59	6.59	24.0	32.0	33.8	22.7	16.3	11.4	0.19
951105	1000	1.02	0.162	0.152	6.19	6.59	24.0	24.0	28.5	23.8	17.6	11.8	0.14
951105	1300	0.90	0.162	0.162	6.19	6.19	22.0	22.0	25.2	26.4	19.8	14.0	0.12
951105	1600	0.79	0.171	0.162	5.83	6.19	26.0	26.0	21.1	32.2	21.1	12.9	0.15
951105	1900	0.70	0.074	0.074	13.56	13.56	-12.0	28.0	16.5	38.2	21.5	18.5	0.14
951105	2200	0.61	0.074	0.074	13.56	13.56	-2.0	-2.0	14.8	36.3	23.8	18.0	0.12
951106	0100	0.56	0.074	0.074	13.56	13.56	-4.0	-4.0	11.5	34.8	26.5	19.4	0.15
951106	0400	0.52	0.074	0.074	13.56	13.56	-4.0	-2.0	11.7	34.6	25.5	18.3	0.17
951106	0700	0.49	0.074	0.074	13.56	13.56	-16.0	-2.0	6.6	36.3	26.2	19.6	0.18
951106	1000	0.47	0.074	0.074	13.56	13.56	-8.0	-6.0	4.6	31.0	24.3	15.8	0.16
951106	1300	0.47	0.083	0.083	11.98	11.98	0.0	-4.0	0.4	29.6	25.7	25.3	0.15
951106	1600	0.46	0.074	0.083	13.56	11.98	-14.0	-2.0	-2.7	27.6	26.5	28.5	0.17
951106	1900	0.44	0.074	0.103	13.56	9.71	-10.0	-8.0	-3.6	24.0	23.9	24.5	0.22
951106	2200	0.43	0.083	0.083	11.98	11.98	-4.0	-4.0	-4.6	24.3	24.6	24.3	0.17
951107	0100	0.42	0.083	0.083	11.98	11.98	-4.0	-6.0	-7.0	22.4	23.1	16.8	0.20
951107	0400	0.38	0.083	0.083	11.98	11.98	-2.0	-6.0	-10.0	26.7	27.1	26.4	0.21
951107	0700	0.34	0.083	0.083	11.98	11.98	-2.0	-6.0	-13.8	26.1	25.0	18.8	0.28
951107	1000	0.34	0.083	0.083	11.98	11.98	-2.0	-4.0	-17.4	33.8	23.0	17.3	0.23
951107	1300	0.46	0.298	0.308	3.35	3.25	-46.0	-48.0	-33.8	34.0	15.2	9.5	0.27
951107	1600	0.57	0.298	0.289	3.35	3.47	-48.0	-50.0	-38.7	20.1	13.0	8.8	0.31
951107	1900	0.47	0.269	0.269	3.72	3.72	-52.0	-50.0	-43.6	20.2	13.8	8.5	0.21
951107	2200	0.48	0.142	0.142	7.04	7.04	-42.0	-44.0	-18.6	50.8	25.6	7.1	0.17
951108	0100	0.85	0.210	0.191	4.75	5.24	54.0	54.0	35.4	37.1	17.8	10.0	0.13
951108	0400	0.97	0.171	0.171	5.83	5.83	44.0	44.0	37.2	29.1	20.4	9.8	0.13
951108	0700	1.07	0.171	0.162	5.83	6.19	44.0	44.0	36.1	25.1	19.8	11.9	0.15
951108	1000	1.10	0.142	0.142	7.04	7.04	24.0	42.0	32.7	25.0	16.2	12.2	0.12
951108	1300	1.02	0.171	0.162	5.83	6.19	38.0	38.0	32.8	25.4	17.3	15.8	0.11
951108	1600	0.96	0.181	0.162	5.52	6.19	36.0	36.0	32.8	26.2	17.3	12.8	0.13
951108	1900	0.90	0.171	0.162	5.83	6.19	38.0	36.0	35.8	23.2	15.2	10.1	0.16
951108	2200	1.22	0.152	0.152	6.59	6.59	26.0	48.0	40.1	21.3	11.8	9.5	0.20
951109	0100	1.49	0.152	0.152	6.59	6.59	32.0	34.0	38.0	20.8	12.5	11.2	0.21
951109	0400	1.43	0.152	0.152	6.59	6.59	38.0	38.0	39.2	19.9	13.4	10.6	0.18
951109	0700	1.43	0.152	0.152	6.59	6.59	40.0	40.0	41.0	20.4	12.7	8.8	0.21
951109	1000	1.18	0.142	0.152	7.04	6.59	24.0	38.0	38.4	21.7	13.5	10.3	0.18
951109	1300	0.95	0.152	0.152	6.59	6.59	24.0	40.0	34.8	24.1	15.9	11.5	0.14
951109	1600	0.82	0.162	0.162	6.19	6.19	30.0	30.0	33.2	24.2	17.4	9.4	0.10
951109	1900	0.71	0.162	0.171	6.19	5.83	32.0	32.0	31.0	27.3	20.0	14.3	0.10
951109	2200	0.58	0.171	0.181	5.83	5.52	32.0	30.0	27.5	36.2	21.5	13.6	0.10
951110	0100	0.51	0.171	0.103	5.83	9.71	28.0	28.0	21.7	37.9	23.0	24.6	0.09
951110	0400	0.47	0.162	0.103	6.19	9.71	28.0	28.0	12.5	37.3	29.1	21.8	0.11
951110	0700	0.46	0.123	0.123	8.16	8.16	-6.0	-6.0	9.7	35.7	31.3	15.0	0.13
951110	1000	0.40	0.142	0.093	7.04	10.72	-6.0	-6.0	1.2	32.5	33.1	25.1	0.13
951110	1300	0.37	0.093	0.103	10.72	9.71	4.0	-8.0	-5.8	29.6	31.2	22.1	0.12
951110	1600	0.39	0.103	0.103	9.71	9.71	-6.0	-6.0	-3.9	33.9	34.0	24.5	0.12

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Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
951110	1900	0.38	0.103	0.103	9.71	9.71	2.0	0.0	-4.2	37.1	36.7	22.8	0.14
951110	2200	0.39	0.318	0.318	3.15	3.15	-62.0	-38.0	-20.9	47.4	32.0	20.1	0.15
951111	0100	0.39	0.298	0.298	3.35	3.35	-52.0	-42.0	-27.4	40.1	26.2	14.2	0.13
951111	0400	0.73	0.191	0.201	5.24	4.98	-34.0	-34.0	-37.1	25.1	21.1	22.5	0.16
951111	0700	1.01	0.171	0.171	5.83	5.83	-46.0	-34.0	-38.8	21.2	20.2	16.6	0.16
951111	1000	1.08	0.142	0.152	7.04	6.59	-40.0	-46.0	-44.6	24.0	20.1	21.9	0.22
951111	1300	1.40	0.132	0.142	7.56	7.04	-38.0	-42.0	-42.9	20.6	17.9	19.0	0.22
951111	1600	1.80	0.123	0.123	8.16	8.16	-34.0	-36.0	-40.2	18.2	16.6	12.9	0.20
951111	1900	2.45	0.113	0.113	8.87	8.87	-34.0	-34.0	-37.8	17.6	17.4	13.8	0.23
951111	2200	1.91	0.103	0.093	9.71	10.72	-32.0	-34.0	-27.1	20.5	20.2	22.4	0.16
951112	0100	1.27	0.083	0.093	11.98	10.72	-34.0	-34.0	-17.7	31.7	24.9	26.4	0.15
951112	0400	1.12	0.093	0.093	10.72	10.72	-12.0	-32.0	7.4	64.1	23.2	31.2	0.16
951112	0700	1.25	0.093	0.093	10.72	10.72	-34.0	-32.0	9.4	67.4	21.1	26.5	0.15
951112	1000	1.13	0.093	0.093	10.72	10.72	-32.0	60.0	9.7	66.2	22.5	28.3	0.18
951112	1300	0.95	0.103	0.103	9.71	9.71	-32.0	-8.0	7.7	50.6	26.0	25.1	0.16
951112	1600	0.85	0.103	0.103	9.71	9.71	-28.0	-6.0	-6.9	42.8	29.2	29.4	0.11
951112	1900	0.80	0.103	0.103	9.71	9.71	-6.0	-4.0	2.0	41.0	32.1	25.0	0.13
951112	2200	0.81	0.103	0.103	9.71	9.71	-4.0	-2.0	4.5	44.4	29.2	25.8	0.14
951113	0100	0.84	0.103	0.103	9.71	9.71	-6.0	-4.0	3.5	38.8	26.4	23.7	0.14
951113	0400	0.83	0.113	0.113	8.87	8.87	-10.0	-8.0	7.2	41.8	27.9	24.2	0.10
951113	1900	1.05	0.093	0.113	10.72	8.87	2.0	-2.0	14.3	43.7	31.2	24.0	0.09
951113	2200	1.12	0.181	0.113	5.52	8.87	38.0	38.0	18.6	46.5	32.5	24.7	0.11
951114	0100	1.28	0.191	0.181	5.24	5.52	32.0	34.0	24.0	48.0	37.1	44.8	0.12
951114	0400	1.44	0.171	0.171	5.83	5.83	28.0	28.0	21.5	43.0	32.5	40.4	0.13
951114	0700	1.67	0.132	0.142	7.56	7.04	-24.0	32.0	16.6	48.6	25.9	21.5	0.19
951114	1000	1.90	0.123	0.142	8.16	7.04	-2.0	38.0	25.0	45.0	28.4	40.7	0.18
951114	1300	1.71	0.113	0.113	8.87	8.87	2.0	34.0	22.2	38.4	25.2	23.6	0.13
951114	1600	1.55	0.103	0.103	9.71	9.71	4.0	4.0	12.3	33.6	27.2	25.0	0.09
951114	1900	1.43	0.093	0.103	10.72	9.71	6.0	6.0	15.2	29.4	27.8	27.4	0.08
951114	2200	1.07	0.093	0.103	10.72	9.71	8.0	8.0	4.0	30.3	29.8	29.3	0.10
951115	0100	0.83	0.083	0.093	11.98	10.72	14.0	6.0	7.4	29.5	29.8	25.3	0.15
951115	0400	0.70	0.083	0.083	11.98	11.98	6.0	8.0	7.7	24.0	25.7	17.6	0.15
951115	0700	0.58	0.093	0.093	10.72	10.72	14.0	10.0	9.7	27.1	26.9	23.7	0.18
951115	1000	0.55	0.074	0.083	13.56	11.98	4.0	6.0	4.8	28.1	27.3	24.9	0.24
951115	1300	0.60	0.074	0.074	13.56	13.56	0.0	2.0	-0.9	25.9	23.7	16.2	0.21
951115	1600	0.52	0.074	0.083	13.56	11.98	2.0	4.0	-1.8	30.9	28.1	25.2	0.16
951115	1900	0.47	0.083	0.083	11.98	11.98	10.0	10.0	-0.3	31.4	27.4	19.0	0.19
951115	2200	0.48	0.083	0.083	11.98	11.98	10.0	8.0	-6.1	33.7	29.2	23.2	0.20
951116	0100	0.49	0.083	0.083	11.98	11.98	2.0	0.0	10.1	40.6	26.8	20.5	0.24
951116	0400	0.53	0.093	0.093	10.72	10.72	4.0	-2.0	16.4	52.9	23.6	26.2	0.20
951116	0700	0.54	0.083	0.083	11.98	11.98	4.0	4.0	9.5	36.6	24.7	22.2	0.17
951116	1000	0.57	0.083	0.083	11.98	11.98	8.0	6.0	5.7	32.6	27.1	22.3	0.16
951116	1300	0.51	0.083	0.083	11.98	11.98	6.0	4.0	5.3	34.2	30.4	23.3	0.23
951116	1600	0.53	0.093	0.093	10.72	10.72	6.0	8.0	2.7	32.2	26.4	25.6	0.19
951116	1900	0.52	0.093	0.093	10.72	10.72	-2.0	-2.0	-2.4	32.3	30.5	26.9	0.13
951116	2200	0.50	0.093	0.093	10.72	10.72	6.0	2.0	0.7	29.4	28.6	23.4	0.18
951117	0100	0.50	0.093	0.093	10.72	10.72	6.0	2.0	0.4	28.0	25.6	21.5	0.27
951117	0400	0.47	0.093	0.093	10.72	10.72	6.0	0.0	-4.9	30.2	27.9	24.0	0.22
951117	0700	0.49	0.103	0.103	9.71	9.71	0.0	-2.0	-4.0	34.0	27.0	26.4	0.16
951117	1000	0.48	0.113	0.103	8.87	9.71	-28.0	0.0	2.5	38.6	26.8	26.0	0.23
951117	1300	0.64	0.269	0.103	3.72	9.71	64.0	64.0	30.6	63.5	19.4	27.2	0.28
951117	1600	0.66	0.220	0.103	4.54	9.71	50.0	52.0	29.5	47.9	26.2	30.3	0.19
951117	1900	0.68	0.210	0.103	4.75	9.71	34.0	32.0	20.8	38.8	23.8	30.2	0.14

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
951117	2200	0.64	0.103	0.103	9.71	9.71	-2.0	26.0	16.3	41.6	27.1	29.4	0.14
951118	0100	0.63	0.103	0.103	9.71	9.71	-6.0	-6.0	8.9	39.9	27.0	25.9	0.13
951118	0400	0.60	0.103	0.103	9.71	9.71	-2.0	-4.0	8.9	38.8	26.4	27.9	0.15
951118	0700	0.56	0.103	0.103	9.71	9.71	2.0	0.0	5.6	36.2	27.4	30.8	0.14
951118	1000	0.56	0.103	0.103	9.71	9.71	0.0	0.0	2.5	31.9	27.7	26.9	0.16
951118	1300	0.53	0.113	0.113	8.87	8.87	4.0	-4.0	-0.5	34.2	30.5	29.6	0.16
951118	1600	0.52	0.074	0.103	13.56	9.71	-6.0	-6.0	0.3	33.1	31.0	33.1	0.18
951118	1900	0.53	0.074	0.083	13.56	11.98	-12.0	0.0	-3.4	29.1	28.5	25.2	0.14
951118	2200	0.56	0.074	0.083	13.56	11.98	-2.0	-2.0	-4.2	28.0	27.4	25.0	0.19
951119	0100	0.54	0.083	0.083	11.98	11.98	4.0	-2.0	-6.8	31.2	29.5	30.0	0.18
951119	0400	0.53	0.083	0.083	11.98	11.98	4.0	-2.0	-2.7	28.6	27.6	25.7	0.22
951119	0700	0.48	0.083	0.083	11.98	11.98	2.0	0.0	1.0	25.3	25.1	20.9	0.24
951119	1000	0.68	0.083	0.083	11.98	11.98	2.0	50.0	24.9	49.9	17.5	24.4	0.27
951119	1300	1.09	0.210	0.210	4.75	4.75	52.0	52.0	41.1	22.7	15.1	8.6	0.28
951119	1600	1.26	0.191	0.191	5.24	5.24	54.0	52.0	40.3	21.7	15.3	14.0	0.24
951119	1900	1.12	0.181	0.181	5.52	5.52	36.0	40.0	36.0	23.1	15.4	10.0	0.22
951119	2200	1.11	0.171	0.171	5.83	5.83	30.0	40.0	31.9	23.7	16.2	12.2	0.16
951120	0100	1.22	0.162	0.162	6.19	6.19	30.0	32.0	33.9	24.3	17.4	10.4	0.19
951120	0400	1.13	0.171	0.162	5.83	6.19	32.0	32.0	32.8	24.6	19.5	13.3	0.19
951120	0700	0.93	0.162	0.162	6.19	6.19	28.0	30.0	27.9	31.9	19.4	11.9	0.13
951120	1000	0.92	0.162	0.152	6.19	6.59	32.0	32.0	22.0	30.2	20.3	17.4	0.10
951120	1300	0.98	0.074	0.074	13.56	13.56	-16.0	20.0	17.2	33.8	21.9	21.5	0.10
951120	1600	0.98	0.074	0.113	13.56	8.87	-6.0	20.0	13.2	33.1	23.4	19.2	0.13
951120	1900	0.90	0.142	0.083	7.04	11.98	16.0	2.0	8.8	29.5	23.7	-24.8	0.11
951120	2200	0.79	0.074	0.083	13.56	11.98	-12.0	4.0	4.5	27.4	25.9	24.2	0.09
951121	0100	0.78	0.083	0.083	11.98	11.98	4.0	0.0	-0.3	27.1	24.4	25.7	0.13
951121	0400	0.87	0.083	0.083	11.98	11.98	8.0	0.0	2.2	26.5	23.7	24.7	0.18
951121	0700	0.95	0.083	0.083	11.98	11.98	16.0	0.0	4.7	28.9	26.6	28.1	0.17
951121	1000	1.08	0.083	0.083	11.98	11.98	14.0	0.0	5.0	24.5	23.1	24.5	0.09
951121	1300	1.26	0.074	0.083	13.56	11.98	-12.0	8.0	0.6	23.5	22.7	25.2	0.09
951121	1600	1.30	0.083	0.083	11.98	11.98	12.0	6.0	5.8	24.2	23.5	23.5	0.11
951121	1900	1.10	0.074	0.083	13.56	11.98	2.0	4.0	6.6	25.4	25.1	25.0	0.11
951121	2200	1.50	0.230	0.083	4.35	11.98	50.0	50.0	27.6	45.6	14.7	23.9	0.22
951122	0100	1.58	0.162	0.074	6.19	13.56	40.0	46.0	26.5	44.5	14.6	18.1	0.20
951122	0400	1.42	0.171	0.083	5.83	11.98	42.0	42.0	23.9	41.0	17.1	21.8	0.20
951122	0700	1.25	0.083	0.083	11.98	11.98	4.0	48.0	23.7	43.1	17.2	21.2	0.23
951122	1000	1.11	0.074	0.083	13.56	11.98	6.0	6.0	21.1	39.7	17.5	24.4	0.16
951122	1300	1.00	0.083	0.083	11.98	11.98	6.0	2.0	18.5	39.8	17.6	21.0	0.13
951122	1600	0.91	0.074	0.083	13.56	11.98	6.0	6.0	15.8	33.8	18.8	20.2	0.15
951122	1900	0.79	0.064	0.083	15.63	11.98	-4.0	0.0	14.3	31.3	19.1	24.0	0.17
951122	2200	0.75	0.074	0.074	13.56	13.56	0.0	2.0	12.0	29.0	20.5	17.1	0.10
951123	0100	0.73	0.074	0.074	13.56	13.56	2.0	2.0	9.8	26.2	20.3	17.9	0.09
951123	0400	0.71	0.074	0.083	13.56	11.98	4.0	2.0	10.5	26.3	24.6	29.2	0.17
951123	0700	0.64	0.074	0.074	13.56	13.56	-12.0	6.0	0.5	25.2	25.0	21.4	0.22
951123	1000	0.57	0.074	0.074	13.56	13.56	0.0	0.0	-3.8	26.9	23.8	21.0	0.17
951123	1300	0.54	0.074	0.083	13.56	11.98	4.0	4.0	-3.8	29.8	22.2	25.4	0.09
951123	1600	0.49	0.074	0.074	13.56	13.56	6.0	6.0	-6.1	33.2	22.4	24.0	0.18
951123	1900	0.47	0.083	0.083	11.98	11.98	8.0	2.0	-7.4	28.5	21.1	21.3	0.20
951123	2200	0.43	0.074	0.083	13.56	11.98	-2.0	-2.0	-12.1	41.1	23.2	30.0	0.14
951124	0100	0.38	0.083	0.074	11.98	13.56	2.0	2.0	-8.8	34.5	22.8	24.3	0.09
951124	0400	0.39	0.074	0.074	13.56	13.56	-2.0	0.0	-13.6	40.4	23.7	20.4	0.17
951124	0700	0.42	0.083	0.083	11.98	11.98	0.0	-2.0	-8.2	42.1	25.8	23.0	0.27
951124	1000	1.05	0.201	0.230	4.98	4.35	54.0	54.0	48.4	17.4	15.6	10.4	0.25

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
951124	1300	1.34	0.191	0.191	5.24	5.24	44.0	42.0	42.7	17.9	15.3	9.7	0.22
951124	1600	1.46	0.171	0.171	5.83	5.83	30.0	34.0	39.3	21.4	18.4	12.9	0.22
951124	1900	1.40	0.171	0.162	5.83	6.19	28.0	30.0	37.7	23.9	21.0	15.4	0.21
951124	2200	1.59	0.162	0.162	6.19	6.19	34.0	38.0	38.0	23.7	21.3	15.6	0.19
951125	0100	1.88	0.162	0.162	6.19	6.19	30.0	34.0	34.6	20.3	16.6	10.8	0.19
951125	0400	1.81	0.162	0.152	6.19	6.59	24.0	24.0	35.1	23.9	19.4	16.7	0.19
951125	0700	1.75	0.152	0.152	6.59	6.59	16.0	52.0	35.4	29.5	21.3	21.0	0.24
951125	1000	1.54	0.162	0.162	6.19	6.19	36.0	52.0	35.6	29.2	19.9	18.5	0.24
951125	1300	1.51	0.162	0.162	6.19	6.19	32.0	32.0	31.6	26.7	16.2	15.9	0.18
951125	1600	1.53	0.152	0.152	6.59	6.59	14.0	14.0	28.3	31.7	17.5	15.9	0.18
951125	1900	1.42	0.142	0.152	7.04	6.59	10.0	10.0	26.3	28.1	17.8	16.7	0.16
951125	2200	1.30	0.142	0.142	7.04	7.04	12.0	12.0	25.6	26.0	17.0	12.9	0.16
951126	0100	1.18	0.142	0.142	7.04	7.04	12.0	14.0	21.0	23.5	17.9	16.9	0.11
951126	0400	1.19	0.142	0.142	7.04	7.04	18.0	14.0	20.8	24.7	19.2	15.8	0.09
951126	0700	1.29	0.132	0.132	7.56	7.56	10.0	12.0	19.3	23.6	19.0	17.2	0.11
951126	1000	1.30	0.142	0.132	7.04	7.56	14.0	16.0	22.0	26.1	20.2	20.5	0.15
951126	1300	1.11	0.132	0.123	7.56	8.16	10.0	22.0	20.4	24.3	18.3	16.5	0.09
951126	1600	1.00	0.132	0.123	7.56	8.16	10.0	12.0	18.0	25.8	20.7	21.0	0.07
951126	1900	0.86	0.123	0.132	8.16	7.56	8.0	12.0	11.4	22.2	20.2	17.8	0.08
951126	2200	0.73	0.123	0.123	8.16	8.16	10.0	10.0	2.9	28.4	23.9	21.1	0.13
951127	0100	0.71	0.103	0.103	9.71	9.71	2.0	6.0	-0.8	30.9	25.6	27.4	0.11
951127	0400	0.69	0.103	0.103	9.71	9.71	0.0	4.0	-2.0	29.4	25.6	27.0	0.10
951127	0700	0.66	0.103	0.103	9.71	9.71	8.0	2.0	-0.1	27.7	23.0	23.3	0.14
951127	1000	0.56	0.103	0.103	9.71	9.71	12.0	4.0	-2.5	36.9	24.6	23.1	0.17
951127	1300	0.54	0.103	0.103	9.71	9.71	-2.0	0.0	-6.4	30.5	22.3	23.2	0.15
951127	1600	0.57	0.103	0.103	9.71	9.71	16.0	4.0	-4.4	40.1	23.8	26.0	0.11
951127	1900	0.63	0.103	0.083	9.71	11.98	2.0	0.0	-13.5	42.3	20.1	25.8	0.16
951127	2200	0.60	0.074	0.093	13.56	10.72	-8.0	-8.0	-13.6	37.0	20.9	28.0	0.15
951128	0100	0.52	0.083	0.083	11.98	11.98	-4.0	-6.0	-15.0	35.8	21.6	26.3	0.17
951128	0400	0.52	0.083	0.083	11.98	11.98	-2.0	-2.0	-19.4	38.6	21.9	22.9	0.11
951128	0700	0.49	0.142	0.093	7.04	10.72	-40.0	-38.0	-19.8	40.3	19.8	23.9	0.15
951128	1000	0.47	0.142	0.083	7.04	11.98	-38.0	-40.0	-25.1	40.3	18.1	25.4	0.17
951128	1300	0.44	0.142	0.083	7.04	11.98	-42.0	-40.0	-27.1	39.5	20.2	28.8	0.18
951128	1600	0.45	0.142	0.083	7.04	11.98	-38.0	-38.0	-21.5	40.6	20.4	23.6	0.10
951128	1900	0.43	0.083	0.083	11.98	11.98	-4.0	-38.0	-20.6	36.8	20.9	22.6	0.11
951128	2200	0.43	0.132	0.083	7.56	11.98	-34.0	-34.0	-25.3	35.0	21.2	23.8	0.18
951129	0100	0.44	0.152	0.083	6.59	11.98	-44.0	-38.0	-29.9	36.8	23.9	34.1	0.17
951129	0400	0.43	0.152	0.083	6.59	11.98	-46.0	-34.0	-28.2	39.1	26.7	26.2	0.14
951129	0700	1.35	0.181	0.181	5.52	5.52	38.0	40.0	42.1	16.4	15.1	8.1	0.20
951129	1000	1.32	0.181	0.181	5.52	5.52	38.0	38.0	39.4	18.5	17.7	10.6	0.18
951129	1300	1.52	0.152	0.152	6.59	6.59	32.0	34.0	37.6	22.3	16.9	10.0	0.24
951129	1600	1.64	0.191	0.191	5.24	5.24	30.0	32.0	37.9	22.1	17.4	16.5	0.24
951129	1900	1.64	0.162	0.171	6.19	5.83	24.0	24.0	34.3	26.0	17.8	17.4	0.22
951129	2200	1.61	0.152	0.162	6.59	6.19	20.0	52.0	34.5	26.7	17.9	16.8	0.24
951130	0100	1.70	0.132	0.162	7.56	6.19	16.0	38.0	35.5	25.9	19.6	18.8	0.23
951130	0400	1.55	0.162	0.162	6.19	6.19	36.0	34.0	28.1	24.6	18.5	15.4	0.19
951130	0700	1.47	0.132	0.113	7.56	8.87	12.0	14.0	23.6	23.3	17.9	21.8	0.15
951130	1000	1.68	0.113	0.113	8.87	8.87	8.0	10.0	25.0	28.0	18.4	18.2	0.19
951130	1300	1.64	0.103	0.103	9.71	9.71	4.0	24.0	24.4	29.7	20.9	23.1	0.19
951130	1600	1.41	0.103	0.103	9.71	9.71	4.0	6.0	17.2	25.3	20.3	19.3	0.14
951130	1900	1.30	0.103	0.103	9.71	9.71	2.0	8.0	13.9	23.1	20.3	17.9	0.08
951130	2200	1.16	0.093	0.093	10.72	10.72	2.0	6.0	12.3	24.5	22.4	17.8	0.08
951201	0100	1.02	0.103	0.103	9.71	9.71	2.0	2.0	6.9	26.2	25.1	20.1	0.12

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Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	x
951201	0400	0.84	0.103	0.103	9.71	9.71	6.0	4.0	4.6	25.2	24.8	23.6	0.10
951201	0700	0.83	0.103	0.103	9.71	9.71	0.0	0.0	-6.0	26.8	25.1	22.4	0.11
951201	1000	0.68	0.103	0.103	9.71	9.71	2.0	4.0	-3.5	27.7	21.3	21.3	0.14
951201	1300	0.61	0.093	0.093	10.72	10.72	14.0	-2.0	-8.7	31.6	20.1	24.0	0.17
951201	1600	0.59	0.083	0.093	11.98	10.72	0.0	-4.0	-12.5	32.8	20.6	28.1	0.13
951201	1900	0.51	0.083	0.083	11.98	11.98	2.0	-8.0	-11.7	35.6	20.6	23.6	0.11
951201	2200	0.42	0.083	0.083	11.98	11.98	-2.0	-12.0	-16.0	37.5	20.1	22.9	0.11
951202	0100	0.39	0.142	0.083	7.04	11.98	-38.0	-38.0	-22.8	39.1	18.1	21.3	0.18
951202	0400	0.36	0.142	0.083	7.04	11.98	-44.0	-42.0	-24.0	46.4	23.7	28.1	0.17
951202	0700	0.34	0.132	0.083	7.56	11.98	-40.0	-40.0	-14.5	42.7	28.7	27.1	0.15
951202	1000	0.77	0.240	0.240	4.17	4.17	54.0	52.0	42.7	24.1	18.3	11.1	0.15
951202	1300	1.02	0.181	0.181	5.52	5.52	38.0	40.0	44.6	24.1	20.6	12.7	0.16
951202	1600	0.97	0.171	0.171	5.83	5.83	40.0	24.0	39.3	29.2	21.8	16.3	0.16
951202	1900	0.92	0.162	0.162	6.19	6.19	24.0	26.0	34.4	27.1	22.4	12.4	0.14
951202	2200	0.79	0.210	0.191	4.75	5.24	44.0	30.0	33.1	32.4	25.6	22.6	0.11
951203	0100	0.69	0.132	0.123	7.56	8.16	16.0	18.0	29.2	35.4	30.6	23.7	0.09
951203	0400	0.64	0.142	0.142	7.04	7.04	22.0	22.0	23.1	32.2	28.0	13.7	0.09
951203	0700	0.59	0.152	0.162	6.59	6.19	24.0	24.0	16.7	37.7	29.1	12.8	0.10
951203	1000	0.58	0.162	0.171	6.19	5.83	24.0	20.0	13.7	37.4	31.6	29.2	0.09
951203	1300	0.54	0.132	0.132	7.56	7.56	-16.0	-12.0	-7.5	37.6	32.8	22.0	0.15
951203	1600	0.56	0.123	0.123	8.16	8.16	-10.0	-10.0	-19.4	44.3	26.9	14.7	0.13
951203	1900	0.54	0.191	0.201	5.24	4.98	-50.0	-52.0	-32.9	44.5	24.0	23.1	0.13
951203	2200	0.52	0.191	0.191	5.24	5.24	-50.0	-52.0	-32.1	43.4	22.2	20.6	0.10
951204	0100	0.50	0.191	0.191	5.24	5.24	-48.0	-50.0	-34.0	42.2	18.4	7.5	0.11
951204	0400	0.48	0.191	0.191	5.24	5.24	-54.0	-52.0	-38.7	38.2	18.8	10.9	0.14
951204	0700	0.38	0.181	0.181	5.52	5.52	-52.0	-52.0	-34.9	42.3	20.2	12.0	0.14
951204	1300	0.84	0.240	0.250	4.17	4.01	56.0	58.0	45.3	24.5	20.0	16.9	0.22
951204	1600	0.88	0.220	0.230	4.54	4.35	52.0	52.0	39.7	30.9	23.8	18.6	0.18
951204	1900	0.85	0.201	0.201	4.98	4.98	38.0	32.0	29.3	28.8	24.9	17.3	0.15
951204	2200	0.87	0.191	0.191	5.24	5.24	32.0	34.0	30.5	28.0	24.8	12.5	0.12
951205	0100	1.09	0.210	0.210	4.75	4.75	42.0	42.0	34.4	29.4	26.7	23.0	0.10
951205	0400	1.05	0.191	0.191	5.24	5.24	24.0	38.0	23.2	31.8	29.1	21.4	0.11
951205	0700	0.97	0.181	0.181	5.52	5.52	40.0	40.0	33.7	36.8	31.5	20.8	0.09
951205	1000	0.95	0.181	0.181	5.52	5.52	36.0	34.0	27.3	41.5	29.1	22.1	0.08
951205	1300	0.97	0.181	0.181	5.52	5.52	26.0	30.0	22.4	40.4	29.8	22.9	0.08
951205	1600	0.89	0.171	0.171	5.83	5.83	32.0	34.0	24.1	41.5	35.1	27.7	0.08
951205	1900	0.80	0.171	0.162	5.83	6.19	34.0	34.0	24.2	42.5	34.1	31.5	0.09
951205	2200	0.69	0.171	0.171	5.83	5.83	34.0	34.0	22.6	41.7	31.5	18.2	0.08
951206	0100	0.60	0.152	0.181	6.59	5.52	-12.0	34.0	20.6	47.1	40.5	44.0	0.10
951206	0400	0.56	0.181	0.181	5.52	5.52	32.0	-10.0	14.2	47.6	46.2	35.6	0.14
951206	0700	0.47	0.152	0.142	6.59	7.04	0.0	0.0	13.7	45.6	47.3	19.9	0.16
951206	1000	0.43	0.318	0.142	3.15	7.04	62.0	-2.0	14.0	51.2	37.5	23.2	0.13
951206	1300	0.78	0.259	0.250	3.86	4.01	54.0	54.0	42.5	30.2	19.2	18.1	0.19
951206	1600	0.93	0.210	0.230	4.75	4.35	46.0	48.0	43.4	30.1	23.8	20.7	0.17
951206	1900	0.94	0.201	0.201	4.98	4.98	44.0	44.0	40.0	28.6	24.3	14.9	0.15
951206	2200	0.85	0.181	0.162	5.52	6.19	38.0	28.0	33.7	32.2	26.9	14.2	0.10
951207	0100	0.85	0.171	0.171	5.83	5.83	28.0	28.0	26.1	38.6	31.9	14.4	0.08
951207	0400	1.12	0.181	0.191	5.52	5.24	34.0	32.0	28.7	33.2	29.5	20.7	0.09
951207	0700	1.69	0.181	0.181	5.52	5.52	40.0	42.0	38.2	30.5	27.4	21.0	0.17
951207	1000	2.30	0.162	0.152	6.19	6.59	40.0	38.0	40.4	23.5	23.0	18.8	0.18
951207	1300	2.01	0.142	0.142	7.04	7.04	24.0	22.0	32.0	28.7	21.2	16.9	0.18
951207	1600	1.69	0.142	0.152	7.04	6.59	18.0	20.0	33.9	30.4	21.1	20.7	0.19
951207	1900	1.27	0.152	0.152	6.59	6.59	22.0	24.0	30.1	27.4	19.9	14.9	0.15
951207	2200	1.00	0.152	0.162	6.59	6.19	20.0	24.0	26.9	27.3	18.3	14.9	0.11

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Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{JDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
951208	0100	0.96	0.162	0.162	6.19	6.19	18.0	18.0	21.8	28.8	17.7	13.8	0.08
951208	0400	1.17	0.171	0.181	5.83	5.52	20.0	26.0	25.7	32.6	18.2	13.0	0.11
951208	0700	1.14	0.171	0.181	5.83	5.52	26.0	28.0	33.1	33.6	21.0	17.2	0.16
951208	1000	1.07	0.152	0.152	6.59	6.59	22.0	34.0	33.7	28.0	19.9	10.5	0.15
951208	1300	1.01	0.152	0.152	6.59	6.59	20.0	26.0	30.8	27.1	20.3	11.2	0.12
951208	1600	1.02	0.152	0.152	6.59	6.59	20.0	26.0	28.8	28.5	23.4	16.6	0.10
951208	1900	0.92	0.162	0.162	6.19	6.19	26.0	26.0	28.1	29.1	24.1	14.5	0.11
951208	2200	0.86	0.162	0.162	6.19	6.19	32.0	30.0	23.7	39.3	32.3	16.6	0.09
951209	0100	1.12	0.240	0.220	4.17	4.54	6.0	-20.0	-6.6	49.1	40.4	44.8	0.10
951209	0400	1.12	0.210	0.210	4.75	4.75	-34.0	-38.0	-27.0	45.0	36.3	30.4	0.14
951209	0700	1.32	0.162	0.171	6.19	5.83	-40.0	-42.0	-43.7	26.2	22.5	19.6	0.16
951209	1000	1.33	0.132	0.132	7.56	7.56	-28.0	-36.0	-37.5	22.1	21.8	15.0	0.13
951209	1300	1.18	0.123	0.113	8.16	8.87	-36.0	-38.0	-36.1	21.9	20.9	22.6	0.12
951209	1600	1.02	0.113	0.113	8.87	8.87	-34.0	-36.0	-34.4	27.0	25.3	21.5	0.13
951209	1900	0.88	0.123	0.113	8.16	8.87	-36.0	-36.0	-26.9	33.6	29.5	24.7	0.14
951209	2200	0.86	0.123	0.103	8.16	9.71	-38.0	-38.0	-4.8	62.8	29.1	29.2	0.15
951210	0100	0.85	0.113	0.113	8.87	8.87	-4.0	52.0	12.4	60.7	25.1	28.8	0.16
951210	0400	0.79	0.123	0.113	8.16	8.87	-34.0	-32.0	-0.2	63.1	25.9	28.4	0.14
951210	0700	1.23	0.181	0.181	5.52	5.52	36.0	36.0	31.2	27.5	19.6	10.6	0.19
951210	1000	1.25	0.152	0.171	6.59	5.83	26.0	32.0	34.7	23.5	17.8	10.9	0.17
951210	1300	1.14	0.142	0.142	7.04	7.04	26.0	30.0	28.9	22.7	18.5	14.1	0.12
951210	1600	0.97	0.152	0.152	6.59	6.59	22.0	22.0	27.0	27.4	19.1	12.5	0.08
951210	1900	0.71	0.162	0.171	6.19	5.83	26.0	26.0	21.0	36.7	20.7	12.6	0.11
951210	2200	0.52	0.210	0.113	4.75	8.87	46.0	34.0	26.3	42.4	20.7	31.8	0.15
951211	0100	0.49	0.318	0.103	3.15	9.71	66.0	62.0	34.9	51.4	16.7	28.9	0.20
951211	0400	0.46	0.298	0.103	3.35	9.71	64.0	64.0	42.9	46.6	16.1	27.2	0.16
951211	0700	0.58	0.191	0.240	5.24	4.17	54.0	58.0	55.4	22.1	14.4	10.3	0.14
951211	1000	0.60	0.210	0.230	4.75	4.35	60.0	60.0	58.8	19.7	14.3	12.0	0.19
951211	1300	0.48	0.210	0.240	4.75	4.17	54.0	56.0	55.7	25.2	16.2	14.9	0.18
951211	1600	0.41	0.250	0.250	4.01	4.01	74.0	88.0	51.9	53.1	18.0	15.1	0.17
951211	1900	0.32	0.269	0.240	3.72	4.17	90.0	88.0	47.1	66.6	21.6	16.8	0.20
951211	2200	0.25	0.279	0.083	3.59	11.98	88.0	90.0	35.2	61.0	27.0	27.9	0.22
951212	0100	0.22	0.083	0.083	11.98	11.98	0.0	12.0	14.2	33.4	29.2	23.0	0.16
951212	0400	0.22	0.064	0.083	15.63	11.98	-8.0	12.0	13.4	32.3	27.7	23.4	0.16
951212	0700	0.26	0.083	0.083	11.98	11.98	0.0	-2.0	26.9	59.2	26.8	25.5	0.21
951212	1000	0.27	0.318	0.083	3.15	11.98	90.0	-2.0	30.7	51.3	26.8	21.9	0.21
951212	1300	0.28	0.142	0.142	7.04	7.04	12.0	12.0	24.1	41.1	25.3	17.3	0.16
951212	1600	0.35	0.162	0.162	6.19	6.19	28.0	28.0	20.0	30.1	21.8	13.4	0.12
951212	1900	0.47	0.171	0.181	5.83	5.52	26.0	26.0	25.3	26.6	20.6	14.6	0.14
951212	2200	0.54	0.171	0.171	5.83	5.83	30.0	30.0	26.5	23.3	19.2	12.1	0.11
951213	0100	0.53	0.181	0.181	5.52	5.52	30.0	28.0	25.9	26.6	18.5	10.4	0.11
951213	0400	0.47	0.162	0.171	6.19	5.83	24.0	24.0	22.7	29.0	21.3	12.5	0.11
951213	0700	0.44	0.171	0.171	5.83	5.83	24.0	24.0	19.9	29.8	23.8	17.1	0.12
951213	1000	0.42	0.181	0.181	5.52	5.52	26.0	24.0	15.5	31.2	25.3	12.7	0.13
951213	1300	0.39	0.171	0.181	5.83	5.52	26.0	24.0	12.6	34.0	25.2	14.4	0.16
951213	1600	0.38	0.064	0.064	15.63	15.63	-10.0	8.0	8.6	35.5	29.1	20.9	0.11
951213	1900	0.42	0.201	0.064	4.98	15.63	26.0	10.0	6.4	36.3	33.5	25.7	0.15
951213	2200	0.45	0.210	0.210	4.75	4.75	26.0	-12.0	8.7	41.8	34.1	21.3	0.11
951214	0100	0.45	0.152	0.220	6.59	4.54	-14.0	-14.0	11.0	43.2	38.5	27.8	0.13
951214	0400	0.44	0.064	0.240	15.63	4.17	-12.0	-4.0	8.0	37.7	35.7	43.1	0.12
951214	0700	0.48	0.298	0.289	3.35	3.47	0.0	-2.0	2.3	33.3	31.0	28.1	0.11
951214	1000	0.48	0.240	0.250	4.17	4.01	20.0	-6.0	5.9	33.3	30.7	33.7	0.12
951214	1300	0.44	0.230	0.230	4.35	4.35	24.0	0.0	3.2	33.8	28.8	24.3	0.13
951214	1600	0.41	0.230	0.113	4.35	8.87	22.0	-4.0	0.9	35.5	27.4	25.6	0.13

Appendix A Table of Collection Times and Bulk Parameters

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
951214	1900	0.41	0.181	0.181	5.52	5.52	-50.0	-50.0	-31.5	45.8	42.8	40.5	0.14
951214	2200	0.46	0.181	0.162	5.52	6.19	-52.0	-52.0	-42.9	40.1	29.4	36.7	0.14
951215	0100	0.42	0.142	0.162	7.04	6.19	-44.0	-50.0	-42.7	36.9	25.7	18.4	0.15
951215	0400	0.37	0.162	0.142	6.19	7.04	-50.0	-48.0	-38.6	35.0	21.4	15.7	0.14
951215	0700	0.36	0.152	0.142	6.59	7.04	-44.0	-44.0	-39.2	32.5	20.2	13.1	0.15
951215	1000	0.36	0.162	0.152	6.19	6.59	-46.0	-46.0	-43.0	31.4	22.3	13.9	0.18
951215	1300	0.34	0.162	0.093	6.19	10.72	-46.0	-46.0	-37.6	38.5	27.9	29.3	0.18
951215	1600	0.34	0.142	0.093	7.04	10.72	-44.0	-38.0	-32.9	36.0	31.0	29.9	0.17
951215	1900	0.32	0.123	0.123	8.16	8.16	-34.0	-36.0	-38.0	34.2	33.9	21.4	0.15
951215	2200	0.35	0.142	0.113	7.04	8.87	-42.0	-40.0	-31.9	35.5	34.4	29.3	0.19
951216	0100	0.35	0.132	0.113	7.56	8.87	-38.0	-38.0	-34.6	39.2	37.0	30.7	0.18
951216	0400	0.39	0.113	0.113	8.87	8.87	-38.0	-40.0	-14.2	56.0	34.8	27.8	0.16
951216	0700	0.45	0.240	0.240	4.17	4.17	36.0	38.0	1.8	59.7	34.3	18.1	0.12
951216	1000	0.54	0.289	0.201	3.47	4.98	66.0	66.0	25.3	65.6	24.1	19.5	0.26
951216	1300	1.55	0.171	0.171	5.83	5.83	46.0	46.0	46.8	13.3	12.1	7.9	0.26
951216	1600	1.93	0.142	0.142	7.04	7.04	26.0	26.0	35.6	21.1	15.5	11.9	0.23
951216	1900	1.74	0.123	0.132	8.16	7.56	12.0	16.0	29.5	26.9	19.4	16.5	0.18
951216	2200	1.51	0.132	0.132	7.56	7.56	14.0	14.0	22.9	26.6	24.3	18.1	0.13
951217	0100	1.44	0.123	0.123	8.16	8.16	10.0	10.0	23.1	26.5	22.9	13.1	0.17
951217	0400	1.58	0.132	0.123	7.56	8.16	10.0	12.0	24.6	29.8	20.1	16.5	0.19
951217	0700	1.75	0.132	0.093	7.56	10.72	12.0	12.0	24.8	30.2	19.3	21.9	0.17
951217	1000	1.80	0.103	0.103	9.71	9.71	2.0	6.0	24.7	32.7	20.1	17.0	0.17
951217	1300	1.82	0.103	0.103	9.71	9.71	8.0	14.0	23.8	31.3	21.0	20.1	0.19
951217	1600	1.83	0.093	0.093	10.72	10.72	8.0	6.0	16.7	26.0	20.7	21.9	0.14
951217	1900	1.65	0.093	0.093	10.72	10.72	2.0	6.0	14.1	26.4	23.0	20.3	0.11
951217	2200	1.74	0.083	0.083	11.98	11.98	6.0	6.0	10.7	24.7	24.3	24.8	0.09
951218	0100	1.61	0.083	0.083	11.98	11.98	6.0	4.0	8.9	25.0	24.0	23.3	0.11
951218	0400	1.55	0.083	0.083	11.98	11.98	6.0	2.0	7.7	26.1	25.1	22.6	0.10
951218	0700	1.41	0.093	0.083	10.72	11.98	6.0	8.0	9.6	28.2	27.4	29.0	0.09
951218	1000	1.24	0.083	0.083	11.98	11.98	4.0	4.0	8.4	29.3	29.1	30.3	0.09
951218	1300	1.22	0.083	0.083	11.98	11.98	10.0	4.0	6.6	30.2	29.9	29.6	0.10
951218	1600	1.11	0.093	0.093	10.72	10.72	0.0	4.0	3.6	29.8	29.6	28.1	0.11
951218	1900	1.01	0.093	0.093	10.72	10.72	0.0	-2.0	4.1	28.6	27.3	25.3	0.10
951218	2200	0.96	0.093	0.093	10.72	10.72	8.0	0.0	3.0	30.4	29.8	28.6	0.09
951219	0100	0.91	0.113	0.093	8.87	10.72	-2.0	-8.0	-1.7	34.3	33.2	37.4	0.12
951219	0400	0.89	0.093	0.093	10.72	10.72	-2.0	-6.0	3.0	37.8	34.0	32.7	0.16
951219	0700	0.97	0.103	0.093	9.71	10.72	-6.0	-4.0	12.3	43.0	29.6	27.1	0.11
951219	1000	1.07	0.093	0.201	10.72	4.98	-6.0	-6.0	10.1	46.7	28.6	24.1	0.09
951219	1300	1.02	0.201	0.191	4.98	5.24	22.0	22.0	7.6	45.3	31.3	19.5	0.11
951219	1600	0.94	0.201	0.191	4.98	5.24	22.0	20.0	8.6	49.4	32.9	17.9	0.14
951219	1900	0.91	0.181	0.181	5.52	5.52	22.0	20.0	4.8	52.9	32.6	16.8	0.13
951219	2200	0.89	0.123	0.103	8.16	9.71	-38.0	32.0	9.1	56.2	32.0	32.7	0.11
951220	0100	1.13	0.142	0.142	7.04	7.04	26.0	22.0	19.8	36.6	26.2	16.9	0.11
951220	0400	1.13	0.123	0.123	8.16	8.16	12.0	34.0	21.5	29.6	23.7	20.3	0.16
951220	0700	1.29	0.181	0.123	5.52	8.16	40.0	42.0	29.0	26.4	17.9	20.2	0.20
951220	1000	1.53	0.298	0.113	3.35	8.87	52.0	50.0	32.2	28.0	14.0	19.0	0.26
951220	1300	1.65	0.132	0.113	7.56	8.87	16.0	22.0	32.2	27.9	15.1	16.9	0.25
951220	1600	1.63	0.152	0.113	6.59	8.87	30.0	30.0	35.8	28.3	16.6	17.9	0.24
951220	1900	1.49	0.132	0.103	7.56	9.71	18.0	40.0	28.8	24.5	17.1	18.1	0.17
951220	2200	1.44	0.152	0.113	6.59	8.87	30.0	28.0	28.5	23.1	14.5	16.0	0.13
951221	0100	1.24	0.132	0.132	7.56	7.56	24.0	28.0	25.5	21.8	15.4	13.5	0.10
951221	0400	1.17	0.142	0.132	7.04	7.56	30.0	26.0	28.4	24.2	17.2	14.3	0.15
951221	0700	1.07	0.152	0.123	6.59	8.16	28.0	28.0	26.0	24.7	16.6	16.3	0.14

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	x
951221	1000	0.92	0.152	0.152	6.59	6.59	24.0	24.0	22.0	25.1	16.5	11.6	0.09
951221	1300	0.80	0.132	0.132	7.56	7.56	10.0	18.0	19.8	23.9	18.2	18.0	0.10
951221	1600	0.68	0.142	0.093	7.04	10.72	26.0	24.0	18.8	25.9	19.6	24.5	0.17
951221	1900	0.57	0.181	0.093	5.52	10.72	30.0	30.0	19.8	31.8	19.3	25.7	0.19
951221	2200	0.51	0.181	0.064	5.52	15.63	34.0	30.0	21.9	32.3	16.5	24.7	0.11
951222	0100	0.69	0.171	0.171	5.83	5.83	40.0	40.0	38.5	37.1	14.7	7.0	0.12
951222	0400	0.90	0.171	0.171	5.83	5.83	46.0	44.0	44.1	27.3	16.5	8.3	0.19
951222	0700	0.89	0.162	0.171	6.19	5.83	46.0	48.0	44.6	27.8	18.0	11.1	0.18
951222	1000	1.00	0.171	0.171	5.83	5.83	44.0	44.0	40.8	30.4	16.7	8.4	0.16
951222	1300	1.10	0.171	0.171	5.83	5.83	44.0	42.0	38.2	28.3	15.9	7.6	0.13
951222	1600	1.01	0.152	0.152	6.59	6.59	30.0	32.0	36.6	27.7	20.2	12.5	0.15
951222	1900	0.91	0.152	0.152	6.59	6.59	28.0	28.0	35.9	24.8	19.8	11.2	0.13
951222	2200	0.82	0.181	0.142	5.52	7.04	44.0	42.0	33.5	25.9	17.8	16.2	0.11
951223	0100	1.00	0.162	0.152	6.19	6.59	26.0	46.0	39.5	28.9	16.6	14.0	0.15
951223	0400	1.15	0.181	0.181	5.52	5.52	44.0	44.0	38.0	27.0	15.5	10.7	0.17
951223	0700	1.06	0.171	0.171	5.83	5.83	40.0	40.0	37.8	22.6	15.5	8.4	0.19
951223	1000	0.87	0.171	0.171	5.83	5.83	38.0	38.0	32.7	22.8	15.5	11.0	0.16
951223	1300	0.72	0.162	0.103	6.19	9.71	28.0	28.0	26.3	30.3	18.1	20.5	0.12
951223	1600	0.68	0.152	0.152	6.59	6.59	24.0	20.0	26.2	27.7	17.6	11.2	0.13
951223	1900	0.60	0.171	0.171	5.83	5.83	24.0	30.0	25.2	27.3	19.8	12.7	0.17
951223	2200	0.57	0.162	0.181	6.19	5.52	20.0	28.0	22.0	27.3	19.4	12.7	0.13
951224	0100	0.55	0.181	0.181	5.52	5.52	28.0	30.0	25.0	30.8	19.0	13.0	0.11
951224	0400	0.51	0.181	0.191	5.52	5.24	28.0	28.0	23.6	30.8	18.5	14.1	0.15
951224	0700	0.64	0.191	0.181	5.24	5.52	40.0	42.0	29.9	25.5	16.2	14.9	0.21
951224	1000	0.73	0.181	0.181	5.52	5.52	30.0	30.0	28.8	19.1	14.7	9.2	0.18
951224	1300	0.70	0.181	0.181	5.52	5.52	36.0	38.0	28.3	21.9	13.4	10.7	0.13
951224	1600	0.72	0.181	0.181	5.52	5.52	34.0	40.0	31.3	21.3	11.9	7.9	0.13
951224	1900	0.73	0.171	0.181	5.83	5.52	28.0	44.0	30.0	21.2	13.7	13.1	0.14
951224	2200	0.61	0.191	0.181	5.24	5.52	42.0	42.0	27.2	24.7	13.9	9.9	0.13
951225	0100	0.51	0.171	0.074	5.83	13.56	32.0	34.0	21.9	28.3	14.2	18.5	0.10
951225	0400	0.57	0.162	0.162	6.19	6.19	28.0	30.0	22.3	24.2	14.6	11.4	0.10
951225	0700	0.69	0.171	0.181	5.83	5.52	32.0	32.0	25.5	21.0	14.8	9.6	0.14
951225	1000	0.67	0.191	0.191	5.24	5.24	38.0	36.0	25.7	26.2	15.6	10.1	0.12
951225	1300	0.59	0.171	0.171	5.83	5.83	34.0	34.0	25.8	26.6	15.6	11.7	0.11
951225	1600	0.57	0.152	0.074	6.59	13.56	6.0	30.0	20.2	27.6	17.2	21.6	0.10
951225	1900	0.51	0.074	0.074	13.56	13.56	-8.0	14.0	17.6	27.3	18.3	20.9	0.14
951225	2200	0.46	0.171	0.074	5.83	13.56	20.0	34.0	21.0	28.0	19.0	23.2	0.15
951226	0100	0.47	0.142	0.074	7.04	13.56	14.0	32.0	19.6	27.0	16.0	22.7	0.13
951226	0400	0.47	0.171	0.171	5.83	5.83	30.0	30.0	23.2	26.8	14.1	14.5	0.11
951226	0700	0.53	0.181	0.181	5.52	5.52	42.0	42.0	31.4	29.1	17.1	21.6	0.11
951226	1000	0.65	0.181	0.181	5.52	5.52	46.0	58.0	40.6	30.5	16.5	23.1	0.15
951226	1300	0.81	0.162	0.162	6.19	6.19	40.0	42.0	40.4	18.9	11.6	6.9	0.14
951226	1600	0.70	0.171	0.152	5.83	6.59	42.0	46.0	36.4	24.8	13.7	14.0	0.10
951226	1900	0.62	0.152	0.152	6.59	6.59	32.0	44.0	35.3	26.6	14.0	15.7	0.09
951226	2200	0.57	0.152	0.152	6.59	6.59	30.0	30.0	33.8	22.0	11.8	9.7	0.11
951227	0100	0.57	0.152	0.152	6.59	6.59	30.0	44.0	34.7	23.7	12.3	10.5	0.08
951227	0400	0.67	0.152	0.142	6.59	7.04	26.0	40.0	31.4	22.9	12.3	15.3	0.08
951227	0700	0.71	0.152	0.152	6.59	6.59	32.0	30.0	30.4	23.7	14.8	14.6	0.08
951227	1000	0.76	0.152	0.152	6.59	6.59	28.0	30.0	31.3	19.4	13.5	8.7	0.10
951227	1300	0.75	0.152	0.152	6.59	6.59	28.0	38.0	35.9	22.1	13.4	9.1	0.14
951227	1600	0.81	0.191	0.191	5.24	5.24	40.0	40.0	38.8	27.7	14.0	7.0	0.16
951227	1900	0.75	0.171	0.191	5.83	5.24	36.0	40.0	36.5	27.4	13.7	10.2	0.10
951227	2200	0.65	0.201	0.201	4.98	4.98	48.0	50.0	34.5	27.1	13.6	10.0	0.11

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
951228	0100	0.85	0.191	0.181	5.24	5.52	36.0	46.0	37.6	18.2	14.1	11.9	0.12
951228	0400	0.87	0.171	0.171	5.83	5.83	42.0	32.0	33.5	18.3	16.9	15.1	0.11
951228	0700	0.81	0.162	0.162	6.19	6.19	32.0	32.0	32.4	17.7	15.1	12.3	0.11
951228	1000	0.93	0.181	0.162	5.52	6.19	28.0	30.0	31.7	16.4	14.4	11.6	0.12
951228	1300	0.85	0.152	0.162	6.59	6.19	24.0	34.0	31.3	19.7	17.0	13.4	0.12
951228	1600	0.68	0.162	0.152	6.19	6.59	26.0	26.0	27.6	19.4	17.7	14.7	0.10
951228	1900	0.61	0.162	0.162	6.19	6.19	18.0	28.0	22.5	26.3	15.7	11.3	0.10
951228	2200	0.61	0.171	0.171	5.83	5.83	22.0	26.0	21.1	23.6	17.2	14.5	0.13
951229	0100	0.89	0.181	0.171	5.52	5.83	32.0	34.0	33.0	18.1	15.5	12.6	0.13
951229	0400	0.98	0.171	0.171	5.83	5.83	32.0	22.0	31.7	20.7	17.8	13.7	0.09
951229	0700	1.09	0.162	0.162	6.19	6.19	22.0	22.0	30.2	21.3	18.4	13.3	0.10
951229	1000	1.11	0.171	0.162	5.83	6.19	36.0	34.0	34.7	23.3	19.0	17.5	0.12
951229	1300	0.97	0.152	0.162	6.59	6.19	20.0	32.0	26.0	19.4	16.1	12.8	0.11
951229	1600	0.88	0.152	0.152	6.59	6.59	22.0	22.0	23.0	21.9	18.2	12.9	0.10
951229	1900	0.87	0.162	0.152	6.19	6.59	22.0	20.0	19.6	24.3	19.9	16.9	0.08
951229	2200	0.85	0.152	0.152	6.59	6.59	16.0	18.0	17.4	23.1	18.9	14.2	0.09
951230	0100	0.76	0.142	0.152	7.04	6.59	14.0	20.0	15.2	29.0	20.1	17.6	0.11
951230	0400	0.65	0.152	0.152	6.59	6.59	16.0	18.0	15.4	29.4	19.8	15.5	0.11
951230	0700	0.62	0.162	0.123	6.19	8.16	14.0	14.0	8.0	29.3	20.4	23.0	0.10
951230	1000	0.58	0.123	0.123	8.16	8.16	-10.0	14.0	1.8	31.6	20.8	15.9	0.13
951230	1300	0.54	0.113	0.113	8.87	8.87	-8.0	-6.0	0.9	32.7	24.4	20.1	0.16
951230	1600	0.48	0.113	0.113	8.87	8.87	-6.0	-6.0	-0.9	29.8	26.6	17.6	0.16
951230	1900	0.44	0.113	0.113	8.87	8.87	-8.0	-8.0	-4.9	27.5	27.3	20.0	0.12
951230	2200	0.43	0.123	0.123	8.16	8.16	-12.0	-10.0	-11.0	24.6	25.7	12.7	0.16
951231	0100	0.39	0.113	0.123	8.87	8.16	-10.0	-8.0	-18.9	27.5	26.1	20.2	0.22
951231	0400	0.34	0.123	0.123	8.16	8.16	-10.0	-24.0	-15.9	29.8	27.9	20.0	0.23
951231	0700	0.32	0.064	0.064	15.63	15.63	-6.0	-6.0	-13.0	29.6	27.1	17.5	0.19
951231	1000	0.34	0.074	0.074	13.56	13.56	2.0	-14.0	-18.8	33.3	24.7	23.8	0.19
951231	1300	0.43	0.191	0.064	5.24	15.63	-52.0	-52.0	-29.6	44.9	19.2	24.7	0.21
951231	1600	0.42	0.171	0.064	5.83	15.63	-50.0	-54.0	-30.4	46.6	21.7	26.1	0.22
951231	1900	0.47	0.152	0.152	6.59	6.59	-46.0	-48.0	-32.4	40.3	20.2	15.5	0.14
951231	2200	0.61	0.132	0.142	7.56	7.04	-42.0	-42.0	-37.5	29.7	17.0	13.3	0.14
960101	0100	0.67	0.132	0.132	7.56	7.56	-42.0	-42.0	-37.4	31.7	21.3	11.6	0.18
960101	0400	0.62	0.132	0.132	7.56	7.56	-42.0	-46.0	-38.2	33.2	24.3	15.8	0.20
960101	0700	0.53	0.132	0.074	7.56	13.56	-40.0	-40.0	-30.3	36.1	29.1	20.2	0.18
960101	1000	0.53	0.132	0.132	7.56	7.56	-38.0	-36.0	-21.3	36.4	29.0	17.7	0.16
960101	1300	0.56	0.123	0.123	8.16	8.16	-38.0	-36.0	-19.3	39.1	28.0	25.7	0.19
960101	1600	0.72	0.123	0.123	8.16	8.16	-40.0	-40.0	-14.7	54.0	26.4	18.9	0.22
960101	1900	0.90	0.113	0.113	8.87	8.87	-36.0	14.0	-4.7	49.1	22.5	18.3	0.14
960101	2200	1.02	0.171	0.162	5.83	6.19	8.0	8.0	1.7	39.2	24.9	19.8	0.10
960102	0100	1.19	0.103	0.123	9.71	8.16	-10.0	-6.0	5.0	33.4	27.9	30.0	0.10
960102	0400	1.13	0.171	0.123	5.83	8.16	16.0	16.0	6.5	31.7	27.3	31.0	0.12
960102	0700	1.00	0.113	0.113	8.87	8.87	-2.0	0.0	10.1	32.3	29.7	25.6	0.12
960102	1000	1.01	0.113	0.123	8.87	8.16	-6.0	-4.0	2.7	34.3	29.1	28.9	0.11
960102	1300	0.98	0.113	0.113	8.87	8.87	2.0	-2.0	5.8	31.2	28.6	23.7	0.11
960102	1600	0.96	0.123	0.123	8.16	8.16	-2.0	0.0	6.3	33.2	31.0	28.4	0.13
960102	1900	0.87	0.123	0.123	8.16	8.16	-4.0	10.0	5.8	34.2	30.3	27.6	0.11
960102	2200	0.84	0.152	0.123	6.59	8.16	4.0	2.0	3.8	35.8	29.1	29.9	0.11
960103	0100	0.81	0.123	0.123	8.16	8.16	0.0	6.0	7.6	32.8	30.1	27.5	0.12
960103	0400	0.80	0.123	0.123	8.16	8.16	4.0	8.0	6.9	40.2	36.6	29.0	0.15
960103	0700	0.72	0.123	0.123	8.16	8.16	6.0	4.0	14.5	41.7	44.6	29.1	0.14
960103	1000	0.66	0.113	0.113	8.87	8.87	-38.0	8.0	-3.4	51.1	53.3	43.1	0.12
960103	1300	0.86	0.123	0.132	8.16	7.56	-40.0	14.0	-3.6	57.6	56.3	44.9	0.10
960103	1600	0.90	0.123	0.123	8.16	8.16	-44.0	14.0	-9.6	52.3	49.2	48.7	0.12

(Sheet 19 of 54)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{JDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
960103	1900	0.77	0.113	0.113	8.87	8.87	12.0	14.0	-19.0	54.3	52.4	40.5	0.17
960103	2200	1.15	0.318	0.259	3.15	3.86	54.0	52.0	34.9	32.8	18.9	8.8	0.32
960104	0100	1.37	0.181	0.181	5.52	5.52	46.0	44.0	41.9	19.3	15.4	8.9	0.25
960104	0400	1.35	0.162	0.162	6.19	6.19	40.0	42.0	37.3	23.6	17.4	14.9	0.21
960104	0700	1.22	0.162	0.152	6.19	6.59	32.0	36.0	35.0	22.2	16.4	15.0	0.17
960104	1000	1.09	0.152	0.152	6.59	6.59	22.0	22.0	30.4	23.5	15.8	10.2	0.17
960104	1300	0.97	0.152	0.152	6.59	6.59	26.0	26.0	26.4	24.2	16.5	9.8	0.13
960104	1600	0.95	0.152	0.152	6.59	6.59	22.0	24.0	23.5	26.4	18.7	7.5	0.11
960104	1900	0.84	0.171	0.162	5.83	6.19	28.0	28.0	18.5	32.5	23.5	13.9	0.10
960104	2200	0.73	0.171	0.103	5.83	9.71	30.0	30.0	14.3	37.2	25.7	33.3	0.09
960105	0100	0.70	0.171	0.113	5.83	8.87	32.0	18.0	13.5	38.8	29.6	39.5	0.09
960105	0400	0.72	0.123	0.113	8.16	8.87	10.0	14.0	15.7	31.4	27.6	23.8	0.12
960105	0700	0.66	0.103	0.103	9.71	9.71	14.0	14.0	14.6	34.8	31.7	28.5	0.14
960105	1000	0.66	0.103	0.103	9.71	9.71	4.0	12.0	11.5	31.5	29.7	31.3	0.11
960105	1300	0.74	0.113	0.113	8.87	8.87	8.0	10.0	19.4	31.8	21.0	22.8	0.16
960105	1600	0.90	0.318	0.103	3.15	9.71	56.0	56.0	27.6	43.5	21.8	30.6	0.23
960105	1900	0.85	0.103	0.103	9.71	9.71	0.0	46.0	23.0	41.2	22.8	24.5	0.17
960105	2200	0.86	0.103	0.103	9.71	9.71	-4.0	24.0	20.9	36.0	22.0	27.9	0.14
960106	0100	0.92	0.210	0.113	4.75	8.87	36.0	24.0	24.4	32.9	19.8	24.7	0.12
960106	0400	1.18	0.171	0.171	5.83	5.83	24.0	26.0	28.1	27.3	19.4	10.2	0.14
960106	0700	1.23	0.162	0.171	6.19	5.83	18.0	38.0	25.6	28.2	23.1	18.3	0.14
960106	1000	1.15	0.162	0.162	6.19	6.19	32.0	30.0	29.5	31.1	21.5	11.4	0.12
960106	1300	1.13	0.152	0.142	6.59	7.04	18.0	20.0	24.0	30.8	21.3	19.8	0.09
960106	1600	1.38	0.152	0.152	6.59	6.59	24.0	24.0	29.7	26.1	22.8	12.1	0.11
960106	1900	1.51	0.181	0.181	5.52	5.52	22.0	22.0	26.2	28.3	25.9	21.1	0.10
960106	2200	1.72	0.171	0.171	5.83	5.83	34.0	36.0	29.2	33.1	31.7	25.9	0.09
960107	0100	2.25	0.152	0.152	6.59	6.59	16.0	16.0	26.0	29.4	28.2	17.5	0.09
960107	0400	2.71	0.142	0.142	7.04	7.04	16.0	14.0	18.9	27.8	28.5	21.0	0.12
960107	0700	2.93	0.132	0.123	7.56	8.16	6.0	6.0	12.3	28.7	28.8	21.9	0.13
960107	1000	3.08	0.113	0.113	8.87	8.87	4.0	6.0	7.6	37.3	36.1	29.4	0.12
960107	1300	2.92	0.113	0.113	8.87	8.87	12.0	8.0	6.5	34.8	33.5	29.3	0.12
960107	1600	2.55	0.103	0.103	9.71	9.71	-2.0	0.0	6.6	37.5	36.7	34.6	0.10
960107	1900	2.30	0.103	0.103	9.71	9.71	10.0	10.0	9.9	37.0	35.8	30.0	0.11
960107	2200	1.72	0.093	0.093	10.72	10.72	14.0	12.0	5.1	37.7	36.1	32.1	0.11
960108	0100	1.41	0.093	0.093	10.72	10.72	6.0	8.0	7.9	34.4	34.0	35.9	0.11
960108	0400	1.14	0.093	0.093	10.72	10.72	22.0	18.0	9.2	34.4	32.2	30.5	0.12
960108	0700	1.11	0.093	0.093	10.72	10.72	16.0	14.0	9.0	33.8	32.6	26.1	0.18
960108	1000	1.10	0.083	0.083	11.98	11.98	16.0	8.0	2.9	32.7	31.6	26.0	0.14
960108	1300	1.14	0.083	0.083	11.98	11.98	18.0	10.0	16.2	26.9	22.2	20.0	0.15
960108	1600	1.63	0.171	0.083	5.83	11.98	40.0	40.0	28.2	31.4	12.6	16.2	0.18
960108	1900	1.81	0.152	0.083	6.59	11.98	38.0	24.0	27.8	27.6	15.7	17.7	0.16
960108	2200	1.80	0.083	0.083	11.98	11.98	10.0	14.0	20.9	24.8	18.2	18.3	0.14
960109	0100	1.58	0.103	0.083	9.71	11.98	6.0	8.0	19.1	23.6	17.5	19.6	0.12
960109	0400	1.33	0.083	0.083	11.98	11.98	4.0	8.0	17.5	24.1	19.0	19.9	0.09
960109	0700	1.27	0.093	0.083	10.72	11.98	14.0	22.0	17.2	23.4	20.7	22.0	0.11
960109	1000	1.07	0.083	0.083	11.98	11.98	10.0	8.0	14.2	24.8	22.9	23.8	0.13
960109	1300	0.90	0.083	0.083	11.98	11.98	16.0	10.0	13.1	27.5	25.4	25.8	0.10
960109	1600	0.81	0.083	0.083	11.98	11.98	14.0	8.0	5.6	31.7	28.6	30.7	0.11
960109	1900	0.71	0.083	0.083	11.98	11.98	6.0	10.0	1.5	34.7	31.2	29.8	0.15
960109	2200	0.69	0.093	0.093	10.72	10.72	8.0	8.0	-4.3	32.2	33.6	24.1	0.14
960110	0100	0.67	0.093	0.093	10.72	10.72	14.0	4.0	-3.6	34.7	33.5	23.3	0.13
960110	0400	0.62	0.093	0.093	10.72	10.72	16.0	8.0	-3.9	33.6	34.6	27.0	0.14
960110	0700	0.63	0.083	0.083	11.98	11.98	16.0	6.0	-3.4	36.7	34.5	30.3	0.16

Appendix A Table of Collection Times and Bulk Parameters

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	x
960110	1000	0.73	0.083	0.083	11.98	11.98	4.0	22.0	9.6	39.3	28.5	34.1	0.15
960110	1300	0.92	0.181	0.083	5.52	11.98	22.0	22.0	15.8	31.7	21.1	30.6	0.11
960110	1600	0.98	0.181	0.093	5.52	10.72	32.0	30.0	23.2	31.7	19.2	28.1	0.11
960110	1900	1.47	0.171	0.171	5.83	5.83	26.0	52.0	34.2	28.7	16.1	12.5	0.23
960110	2200	1.93	0.152	0.152	6.59	6.59	36.0	36.0	36.1	21.2	14.3	9.9	0.22
960111	0100	1.55	0.142	0.142	7.04	7.04	22.0	36.0	32.8	24.9	16.6	14.1	0.20
960111	0400	1.31	0.142	0.142	7.04	7.04	20.0	22.0	30.2	25.3	16.5	11.2	0.17
960111	0700	1.24	0.152	0.152	6.59	6.59	28.0	28.0	29.4	25.4	19.4	11.2	0.14
960111	1000	1.14	0.152	0.152	6.59	6.59	24.0	26.0	26.4	25.4	20.6	9.2	0.15
960111	1300	0.98	0.152	0.152	6.59	6.59	26.0	26.0	25.5	27.0	20.7	12.2	0.12
960111	1600	0.90	0.152	0.093	6.59	10.72	20.0	22.0	18.5	29.6	20.9	23.4	0.10
960111	1900	0.93	0.171	0.083	5.83	11.98	22.0	20.0	17.7	30.7	20.9	23.6	0.10
960111	2200	0.90	0.083	0.083	11.98	11.98	2.0	22.0	17.2	36.6	26.1	26.0	0.12
960112	0100	1.02	0.093	0.093	10.72	10.72	8.0	10.0	14.2	35.2	28.6	25.7	0.10
960112	0400	1.22	0.093	0.093	10.72	10.72	-2.0	0.0	-5.1	40.1	39.5	23.3	0.11
960112	0700	1.36	0.093	0.093	10.72	10.72	-2.0	-4.0	-27.9	44.3	40.2	25.8	0.14
960112	1000	1.73	0.132	0.113	7.56	8.87	-42.0	-42.0	-32.9	37.5	31.6	36.7	0.15
960112	1300	1.43	0.113	0.093	8.87	10.72	-38.0	-38.0	-26.6	38.3	34.4	31.7	0.14
960112	1600	1.21	0.093	0.093	10.72	10.72	-34.0	0.0	-19.4	36.5	34.2	34.0	0.11
960112	1900	1.09	0.093	0.093	10.72	10.72	4.0	2.0	-8.7	38.9	35.6	34.1	0.11
960112	2200	1.06	0.093	0.093	10.72	10.72	-2.0	-2.0	-9.7	38.2	35.1	34.0	0.16
960113	0100	0.94	0.093	0.093	10.72	10.72	0.0	-2.0	-14.8	36.5	35.5	32.2	0.15
960113	0400	0.83	0.093	0.093	10.72	10.72	6.0	0.0	-7.0	36.0	32.3	28.6	0.13
960113	0700	0.84	0.103	0.093	9.71	10.72	-32.0	8.0	-8.4	39.9	33.0	29.0	0.12
960113	1000	0.94	0.103	0.093	9.71	10.72	-38.0	48.0	19.3	51.4	22.0	29.3	0.13
960113	1300	1.07	0.191	0.103	5.24	9.71	44.0	44.0	21.8	42.8	19.0	32.6	0.12
960113	1600	1.08	0.171	0.162	5.83	6.19	36.0	36.0	20.0	33.7	19.5	13.3	0.09
960113	1900	1.02	0.162	0.162	6.19	6.19	30.0	32.0	19.8	30.5	19.8	10.4	0.09
960113	2200	0.83	0.171	0.103	5.83	9.71	34.0	34.0	13.1	34.9	22.9	35.6	0.11
960114	0100	0.74	0.181	0.103	5.52	9.71	34.0	26.0	10.4	39.3	23.7	31.5	0.14
960114	0400	0.68	0.152	0.103	6.59	9.71	30.0	18.0	13.1	36.7	24.5	34.4	0.11
960114	0700	0.68	0.162	0.093	6.19	10.72	18.0	18.0	10.8	30.4	22.6	23.7	0.09
960114	1000	0.66	0.162	0.093	6.19	10.72	18.0	16.0	13.7	29.7	24.1	26.1	0.13
960114	1300	0.66	0.093	0.093	10.72	10.72	0.0	20.0	8.3	33.8	27.0	28.5	0.13
960114	1600	0.62	0.093	0.093	10.72	10.72	14.0	16.0	12.6	35.5	30.6	31.0	0.12
960114	1900	0.59	0.093	0.093	10.72	10.72	-2.0	-8.0	1.4	36.4	30.8	29.8	0.10
960114	2200	0.53	0.103	0.103	9.71	9.71	-6.0	-2.0	-2.6	36.6	32.2	32.9	0.16
960115	0100	0.53	0.093	0.093	10.72	10.72	0.0	-4.0	-13.2	40.9	31.2	32.1	0.18
960115	0400	0.52	0.113	0.103	8.87	9.71	-34.0	-10.0	-19.6	37.8	25.4	32.4	0.18
960115	0700	0.51	0.074	0.103	13.56	9.71	6.0	-8.0	-12.7	34.5	24.0	27.8	0.11
960115	1000	0.52	0.074	0.074	13.56	13.56	4.0	2.0	-7.8	33.1	24.6	20.9	0.16
960115	1300	0.52	0.074	0.074	13.56	13.56	4.0	-12.0	-18.7	39.5	25.1	23.6	0.20
960115	1600	0.51	0.074	0.074	13.56	13.56	2.0	-8.0	-14.3	36.0	25.9	22.7	0.16
960115	1900	0.68	0.074	0.074	13.56	13.56	-2.0	12.0	10.4	40.5	25.7	19.1	0.11
960115	2200	0.92	0.191	0.220	5.24	4.54	4.0	8.0	11.5	31.9	25.4	20.9	0.12
960116	0100	1.08	0.191	0.191	5.24	5.24	22.0	18.0	16.8	28.8	25.1	13.7	0.15
960116	0400	1.18	0.152	0.171	6.59	5.83	26.0	26.0	23.8	31.6	27.1	19.9	0.13
960116	0700	1.23	0.152	0.152	6.59	6.59	18.0	20.0	20.2	35.3	29.8	24.9	0.11
960116	1000	1.25	0.152	0.152	6.59	6.59	24.0	20.0	20.5	35.7	30.3	24.0	0.09
960116	1300	1.34	0.152	0.152	6.59	6.59	16.0	16.0	20.8	32.4	28.0	20.7	0.13
960116	1600	1.31	0.142	0.142	7.04	7.04	16.0	14.0	17.7	34.2	27.4	20.0	0.13
960116	1900	1.24	0.142	0.142	7.04	7.04	14.0	12.0	15.6	31.4	27.9	21.2	0.08
960116	2200	1.25	0.142	0.142	7.04	7.04	10.0	8.0	10.8	29.9	28.0	26.8	0.08

(Sheet 21 of 54)

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
960117	0100	1.25	0.123	0.123	8.16	8.16	4.0	8.0	8.2	33.0	33.1	24.3	0.10
960117	0400	1.14	0.123	0.123	8.16	8.16	2.0	8.0	5.9	34.8	36.2	24.1	0.11
960117	0700	0.98	0.113	0.113	8.87	8.87	-2.0	8.0	4.9	33.1	34.6	27.8	0.10
960117	1000	0.91	0.113	0.113	8.87	8.87	-6.0	-8.0	-1.8	30.2	31.5	26.1	0.08
960117	1300	0.87	0.123	0.113	8.16	8.87	6.0	4.0	1.9	29.8	31.7	30.3	0.10
960117	1600	0.79	0.113	0.113	8.87	8.87	4.0	0.0	1.2	32.7	33.3	27.8	0.11
960117	1900	0.77	0.113	0.113	8.87	8.87	4.0	4.0	-0.3	29.7	30.1	25.7	0.08
960117	2200	0.81	0.113	0.113	8.87	8.87	-6.0	0.0	-8.1	31.9	29.5	26.6	0.07
960118	0100	0.83	0.113	0.113	8.87	8.87	-8.0	-6.0	-14.5	34.3	30.1	27.1	0.10
960118	0400	0.79	0.103	0.113	9.71	8.87	-2.0	0.0	-19.9	37.1	30.5	31.3	0.15
960118	0700	0.72	0.113	0.113	8.87	8.87	-4.0	-2.0	-16.2	36.0	30.4	29.3	0.11
960118	1000	0.80	0.162	0.113	6.19	8.87	-46.0	-44.0	-26.0	36.5	25.4	28.4	0.08
960118	1300	0.94	0.152	0.152	6.59	6.59	-42.0	-40.0	-32.3	32.1	29.0	28.4	0.12
960118	1600	1.11	0.142	0.132	7.04	7.56	-38.0	-40.0	-36.2	27.7	24.8	25.3	0.13
960118	1900	1.31	0.123	0.132	8.16	7.56	-14.0	-30.0	-28.5	27.5	25.2	26.7	0.13
960118	2200	1.52	0.132	0.123	7.56	8.16	-38.0	-36.0	-31.3	26.2	25.1	25.1	0.13
960119	0100	1.70	0.113	0.113	8.87	8.87	-18.0	-22.0	-29.5	24.4	24.1	23.7	0.15
960119	0400	1.89	0.113	0.113	8.87	8.87	-36.0	-36.0	-39.4	25.6	24.1	25.7	0.24
960119	0700	1.95	0.113	0.103	8.87	9.71	-34.0	-36.0	-39.3	25.6	21.3	23.1	0.25
960119	1000	1.92	0.103	0.103	9.71	9.71	-32.0	-34.0	-38.2	24.4	20.5	20.5	0.23
960119	1300	1.86	0.103	0.103	9.71	9.71	-34.0	-32.0	-32.9	20.7	20.8	21.7	0.13
960119	1600	1.69	0.093	0.103	10.72	9.71	-36.0	-34.0	-32.2	24.1	23.6	22.3	0.14
960119	1900	1.18	0.093	0.093	10.72	10.72	-32.0	-34.0	-27.9	28.6	28.4	25.9	0.14
960119	2200	1.02	0.103	0.093	9.71	10.72	-32.0	-34.0	-4.0	52.2	26.8	32.4	0.14
960120	0100	1.60	0.191	0.181	5.24	5.52	48.0	48.0	30.6	41.8	18.6	14.2	0.18
960120	0400	1.91	0.162	0.162	6.19	6.19	40.0	48.0	33.6	30.9	20.0	12.2	0.23
960120	0700	1.93	0.162	0.103	6.19	9.71	36.0	36.0	29.2	40.3	21.7	27.0	0.21
960120	1000	1.76	0.103	0.103	9.71	9.71	-12.0	32.0	19.3	44.8	22.1	22.1	0.16
960120	1300	1.61	0.103	0.103	9.71	9.71	-30.0	16.0	11.3	41.7	24.5	27.1	0.12
960120	1600	1.50	0.162	0.103	6.19	9.71	24.0	22.0	12.9	42.2	24.8	28.1	0.14
960120	1900	1.40	0.103	0.093	9.71	10.72	-32.0	36.0	14.1	50.5	27.9	35.3	0.17
960120	2200	1.26	0.103	0.093	9.71	10.72	-10.0	18.0	6.9	46.7	26.7	32.6	0.13
960121	0100	1.21	0.103	0.103	9.71	9.71	-2.0	4.0	11.9	39.6	28.9	26.5	0.10
960121	0400	1.20	0.103	0.103	9.71	9.71	-30.0	-6.0	3.0	41.7	31.0	28.8	0.11
960121	0700	1.14	0.103	0.103	9.71	9.71	-32.0	-6.0	7.7	50.7	31.7	33.8	0.15
960121	1000	1.04	0.103	0.103	9.71	9.71	-4.0	-4.0	7.4	43.8	34.4	30.3	0.13
960121	1300	1.02	0.103	0.103	9.71	9.71	-6.0	-6.0	9.5	40.7	30.0	31.1	0.09
960121	1600	1.17	0.113	0.103	8.87	9.71	-6.0	-4.0	11.8	38.8	26.6	30.1	0.12
960121	1900	1.14	0.220	0.103	4.54	9.71	40.0	40.0	15.5	41.2	25.7	34.1	0.16
960121	2200	1.14	0.093	0.093	10.72	10.72	-2.0	36.0	14.8	40.6	24.6	33.0	0.17
960122	0100	1.26	0.103	0.103	9.71	9.71	-6.0	34.0	14.4	39.8	18.7	22.0	0.15
960122	0400	1.38	0.181	0.103	5.52	9.71	32.0	30.0	18.1	34.9	21.8	27.6	0.12
960122	0700	1.52	0.093	0.103	10.72	9.71	-4.0	24.0	15.7	34.3	23.2	29.8	0.16
960122	1000	1.39	0.103	0.093	9.71	10.72	-4.0	22.0	18.1	36.1	24.8	32.9	0.14
960122	1300	1.36	0.152	0.103	6.59	9.71	22.0	22.0	14.9	34.1	23.5	25.6	0.10
960122	1600	1.38	0.093	0.103	10.72	9.71	-6.0	12.0	10.5	32.8	23.9	26.7	0.08
960122	1900	1.26	0.103	0.103	9.71	9.71	-6.0	16.0	10.6	34.1	27.2	31.4	0.09
960122	2200	1.15	0.103	0.103	9.71	9.71	4.0	12.0	6.8	33.3	26.3	28.7	0.11
960123	0100	1.10	0.103	0.103	9.71	9.71	4.0	8.0	7.0	30.8	26.3	26.2	9.99
960123	0400	1.14	0.103	0.103	9.71	9.71	-6.0	-2.0	2.8	31.0	27.8	30.1	0.08
960123	0700	1.19	0.103	0.103	9.71	9.71	-4.0	-2.0	1.7	27.9	26.8	26.2	0.10
960123	1000	1.09	0.093	0.093	10.72	10.72	-6.0	-6.0	-6.5	24.6	24.4	17.2	0.11
960123	1300	1.05	0.103	0.103	9.71	9.71	-4.0	0.0	0.9	27.8	27.9	28.5	0.08
960123	1600	1.02	0.103	0.103	9.71	9.71	-4.0	2.0	0.8	28.4	28.6	31.3	0.08

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Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
960123	1900	0.98	0.103	0.103	9.71	9.71	0.0	0.0	-2.1	31.2	31.2	27.6	0.12
960123	2200	0.94	0.103	0.093	9.71	10.72	-2.0	-4.0	-5.2	28.0	27.8	27.6	0.13
960124	0100	0.88	0.103	0.103	9.71	9.71	6.0	-2.0	-4.2	29.5	28.7	27.9	0.09
960124	0400	0.87	0.113	0.103	8.87	9.71	2.0	-4.0	-13.3	31.1	28.2	30.4	0.08
960124	0700	1.00	0.103	0.103	9.71	9.71	-6.0	-8.0	-24.5	34.7	24.0	27.1	0.13
960124	1000	1.04	0.308	0.103	3.25	9.71	-56.0	-46.0	-33.2	37.5	20.5	27.0	0.21
960124	1300	0.94	0.123	0.113	8.16	8.87	-36.0	-36.0	-31.8	29.1	20.3	23.9	0.15
960124	1600	0.91	0.123	0.103	8.16	9.71	-36.0	-36.0	-29.7	28.5	22.6	27.5	0.11
960124	1900	0.83	0.103	0.103	9.71	9.71	-6.0	-36.0	-23.3	31.3	21.9	23.2	0.14
960124	2200	0.80	0.132	0.103	7.56	9.71	-40.0	-38.0	-25.0	34.7	28.6	31.0	0.19
960125	0100	0.75	0.113	0.093	8.87	10.72	-34.0	66.0	3.2	82.6	25.2	31.1	0.21
960125	0400	0.77	0.250	0.103	4.01	9.71	56.0	56.0	22.4	64.9	19.6	26.3	0.18
960125	0700	0.72	0.240	0.093	4.17	10.72	58.0	58.0	28.1	65.2	20.7	26.6	0.21
960125	1000	0.80	0.269	0.093	3.72	10.72	58.0	58.0	29.7	59.2	21.1	31.4	0.25
960125	1300	1.16	0.171	0.171	5.83	5.83	36.0	36.0	38.1	31.6	18.7	11.8	0.17
960125	1600	1.04	0.181	0.093	5.52	10.72	44.0	42.0	32.8	40.7	20.8	22.5	0.16
960125	1900	1.01	0.142	0.142	7.04	7.04	16.0	16.0	29.2	35.3	22.1	10.0	0.13
960125	2200	0.95	0.142	0.181	7.04	5.52	18.0	20.0	22.6	37.0	26.5	19.4	0.13
960126	0100	0.79	0.152	0.083	6.59	11.98	22.0	20.0	19.1	43.5	28.7	24.4	0.13
960126	0400	0.72	0.093	0.093	10.72	10.72	-30.0	20.0	14.2	42.4	31.2	24.1	0.11
960126	0700	0.72	0.093	0.093	10.72	10.72	-6.0	18.0	13.6	38.8	31.4	25.4	0.11
960126	1000	0.76	0.093	0.093	10.72	10.72	-30.0	14.0	2.0	43.8	37.8	30.3	0.11
960126	1300	0.85	0.093	0.093	10.72	10.72	-4.0	16.0	8.5	44.0	39.9	27.4	0.11
960126	1600	0.84	0.103	0.210	9.71	4.75	-6.0	-8.0	6.4	40.6	38.4	34.6	0.09
960126	1900	0.80	0.103	0.103	9.71	9.71	-6.0	-6.0	3.3	39.8	37.3	26.1	0.09
960126	2200	0.87	0.181	0.201	5.52	4.98	-24.0	-26.0	-6.1	44.2	42.8	55.1	0.10
960127	0100	1.15	0.142	0.162	7.04	6.19	-40.0	-42.0	-44.4	31.3	34.7	23.7	0.14
960127	0400	1.62	0.132	0.123	7.56	8.16	-40.0	-38.0	-43.0	24.6	24.7	16.4	0.22
960127	0700	2.03	0.113	0.113	8.87	8.87	-34.0	-34.0	-41.5	23.6	23.2	18.6	0.22
960127	1000	2.22	0.103	0.103	9.71	9.71	-32.0	-34.0	-39.7	24.1	22.2	19.2	0.23
960127	1300	2.08	0.103	0.103	9.71	9.71	-34.0	-34.0	-33.1	20.7	21.3	20.0	0.16
960127	1600	1.86	0.103	0.093	9.71	10.72	-34.0	-32.0	-31.1	22.0	22.0	21.1	0.13
960127	1900	1.59	0.103	0.093	9.71	10.72	-32.0	-34.0	-29.9	23.1	22.9	24.0	0.10
960127	2200	1.38	0.103	0.103	9.71	9.71	-16.0	-12.0	-8.1	36.2	26.1	30.4	0.11
960128	0100	1.06	0.093	0.093	10.72	10.72	-8.0	58.0	4.1	73.8	23.7	29.1	0.17
960128	0400	0.99	0.230	0.093	4.35	10.72	52.0	54.0	20.5	65.0	18.6	30.1	0.22
960128	0700	0.93	0.240	0.103	4.17	9.71	52.0	52.0	15.4	61.2	17.9	27.5	0.20
960128	1000	1.15	0.201	0.103	4.98	9.71	48.0	50.0	28.4	50.6	19.7	31.4	0.19
960128	1300	1.19	0.162	0.103	6.19	9.71	34.0	54.0	33.9	44.0	19.3	32.3	0.20
960128	1600	1.14	0.191	0.103	5.24	9.71	46.0	44.0	24.8	51.9	20.5	27.5	0.18
960128	1900	1.04	0.171	0.103	5.83	9.71	34.0	34.0	17.0	48.0	23.7	29.1	0.12
960128	2200	0.98	0.093	0.103	10.72	9.71	-28.0	0.0	12.2	44.9	27.3	33.0	0.11
960129	0100	0.90	0.103	0.103	9.71	9.71	-30.0	-8.0	3.7	46.6	29.2	25.0	0.11
960129	0400	0.85	0.103	0.103	9.71	9.71	-2.0	-4.0	11.3	38.3	28.8	24.8	0.12
960129	0700	0.89	0.103	0.103	9.71	9.71	-8.0	4.0	5.8	34.7	31.1	26.8	0.08
960129	1000	0.91	0.103	0.103	9.71	9.71	-32.0	-8.0	-6.7	38.6	32.8	28.7	0.08
960129	1300	0.94	0.103	0.103	9.71	9.71	-2.0	-6.0	-1.1	42.2	38.0	31.2	0.11
960129	1600	0.89	0.103	0.103	9.71	9.71	-4.0	-6.0	-0.9	38.2	35.7	31.0	0.11
960129	1900	0.85	0.103	0.093	9.71	10.72	-30.0	-8.0	-5.3	38.2	34.9	32.3	0.10
960129	2200	0.85	0.093	0.103	10.72	9.71	-6.0	-6.0	-2.3	37.7	36.6	34.7	0.11
960130	0100	0.85	0.093	0.093	10.72	10.72	0.0	-4.0	-11.6	40.6	38.1	29.6	0.11
960130	0400	0.79	0.103	0.093	9.71	10.72	-4.0	-4.0	-9.2	40.8	38.4	34.7	0.12
960130	0700	0.75	0.093	0.103	10.72	9.71	-32.0	-4.0	-12.9	41.3	39.2	35.4	0.12

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Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
960130	1000	0.68	0.103	0.103	9.71	9.71	-10.0	-6.0	-14.7	39.6	38.2	30.0	0.11
960130	1300	0.69	0.103	0.103	9.71	9.71	-30.0	-36.0	-20.4	40.5	36.2	26.8	0.11
960130	1600	0.67	0.103	0.103	9.71	9.71	-4.0	-40.0	-16.8	40.0	33.0	27.5	0.13
960130	1900	0.62	0.152	0.093	6.59	10.72	-40.0	-40.0	-18.2	38.3	32.2	27.6	0.12
960130	2200	0.62	0.152	0.103	6.59	9.71	-44.0	-4.0	-16.2	37.1	32.9	32.0	0.12
960131	0100	0.61	0.162	0.103	6.19	9.71	-42.0	-8.0	-17.3	36.5	32.3	33.0	0.14
960131	0400	0.58	0.162	0.093	6.19	10.72	-44.0	-42.0	-19.2	39.4	32.4	36.1	0.20
960131	0700	0.53	0.083	0.083	11.98	11.98	-2.0	-4.0	-17.5	36.2	33.5	28.6	0.16
960131	1000	0.62	0.308	0.308	3.25	3.25	52.0	52.0	9.5	60.3	26.2	8.9	0.29
960131	1300	1.38	0.250	0.201	4.01	4.98	48.0	46.0	39.7	11.8	10.7	6.3	0.34
960131	1600	1.44	0.171	0.171	5.83	5.83	42.0	42.0	36.2	16.1	13.9	9.1	0.19
960131	1900	1.61	0.171	0.162	5.83	6.19	38.0	38.0	32.6	18.4	15.0	13.5	0.18
960131	2200	1.57	0.162	0.162	6.19	6.19	38.0	40.0	29.7	22.3	17.4	15.9	0.17
960201	0100	1.52	0.142	0.162	7.04	6.19	22.0	34.0	31.0	22.9	19.5	18.4	0.17
960201	0400	1.42	0.152	0.152	6.59	6.59	22.0	40.0	28.3	27.2	21.6	16.0	0.18
960201	0700	1.19	0.162	0.132	6.19	7.56	36.0	38.0	24.9	30.3	23.4	20.7	0.13
960201	1000	0.99	0.142	0.132	7.04	7.56	16.0	18.0	19.5	29.5	21.8	21.6	0.11
960201	1300	0.91	0.142	0.142	7.04	7.04	14.0	14.0	15.1	30.1	23.4	20.5	0.10
960201	1600	0.92	0.152	0.074	6.59	13.56	16.0	16.0	16.7	35.3	26.0	24.6	0.11
960201	1900	0.87	0.142	0.142	7.04	7.04	12.0	12.0	18.2	36.2	27.3	23.0	0.11
960201	2200	0.84	0.074	0.074	13.56	13.56	4.0	6.0	17.3	34.8	28.2	26.1	0.11
960202	0100	0.83	0.074	0.074	13.56	13.56	-18.0	2.0	7.8	33.1	27.9	25.7	0.11
960202	0400	0.84	0.074	0.074	13.56	13.56	-14.0	2.0	12.7	38.4	28.2	23.2	0.16
960202	0700	1.25	0.289	0.298	3.47	3.35	48.0	46.0	33.6	31.9	16.3	8.4	0.32
960202	1000	1.12	0.210	0.201	4.75	4.98	42.0	44.0	28.8	38.2	17.6	17.0	0.19
960202	1300	1.33	0.191	0.181	5.24	5.52	38.0	38.0	31.2	24.3	18.3	13.7	0.18
960202	1600	1.42	0.171	0.171	5.83	5.83	40.0	40.0	33.1	24.2	19.8	19.5	0.18
960202	1900	1.79	0.162	0.162	6.19	6.19	40.0	40.0	36.5	20.6	19.3	17.3	0.18
960202	2200	1.91	0.162	0.152	6.19	6.59	38.0	38.0	36.1	23.6	21.5	22.1	0.17
960203	0100	2.35	0.132	0.132	7.56	7.56	20.0	44.0	32.7	25.4	21.2	17.0	0.21
960203	0400	2.92	0.142	0.132	7.04	7.56	32.0	44.0	35.0	25.0	19.3	19.0	0.27
960203	0700	2.91	0.123	0.123	8.16	8.16	16.0	16.0	27.9	25.6	20.1	18.4	0.22
960203	1000	2.68	0.113	0.103	8.87	9.71	18.0	18.0	26.8	25.1	20.0	17.4	0.18
960203	1300	2.58	0.103	0.103	9.71	9.71	10.0	14.0	23.5	26.3	20.7	18.1	0.18
960203	1600	2.55	0.103	0.103	9.71	9.71	8.0	6.0	22.4	29.4	21.5	19.0	0.19
960203	1900	2.72	0.093	0.103	10.72	9.71	8.0	42.0	27.2	27.7	19.2	17.9	0.22
960203	2200	2.82	0.103	0.103	9.71	9.71	8.0	12.0	26.6	25.4	19.4	14.6	0.20
960204	0100	2.69	0.113	0.103	8.87	9.71	2.0	18.0	24.3	29.0	21.0	18.8	0.21
960204	0400	2.81	0.113	0.113	8.87	8.87	8.0	44.0	25.0	30.6	18.6	12.6	0.23
960204	0700	2.94	0.103	0.103	9.71	9.71	8.0	44.0	27.0	30.0	17.4	13.7	0.25
960204	1000	2.89	0.093	0.093	10.72	10.72	4.0	44.0	24.3	29.9	20.5	18.3	0.22
960204	1300	2.54	0.093	0.093	10.72	10.72	6.0	6.0	19.4	27.6	20.6	18.0	0.17
960204	1600	2.40	0.093	0.093	10.72	10.72	6.0	6.0	18.5	29.1	22.2	19.6	0.14
960204	1900	2.10	0.093	0.093	10.72	10.72	6.0	6.0	16.6	25.2	19.6	20.7	0.14
960204	2200	1.92	0.083	0.083	11.98	11.98	0.0	6.0	16.8	26.3	18.1	19.0	0.14
960205	0100	1.87	0.093	0.093	10.72	10.72	10.0	6.0	16.9	26.5	19.8	22.0	0.13
960205	0400	1.84	0.083	0.093	11.98	10.72	2.0	6.0	19.0	27.9	20.9	20.0	0.13
960205	0700	1.74	0.103	0.093	9.71	10.72	4.0	6.0	18.4	27.8	21.2	23.7	0.11
960205	1000	1.55	0.093	0.093	10.72	10.72	2.0	6.0	17.6	26.5	20.4	18.1	0.10
960205	1300	1.43	0.103	0.103	9.71	9.71	2.0	4.0	11.6	24.2	21.5	21.7	0.09
960205	1600	1.29	0.103	0.103	9.71	9.71	8.0	8.0	9.6	21.8	20.4	17.0	0.09
960205	1900	1.15	0.083	0.083	11.98	11.98	-2.0	0.0	4.6	25.4	22.7	19.0	0.12
960205	2200	0.95	0.083	0.093	11.98	10.72	0.0	2.0	4.4	26.7	26.6	30.2	0.10

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	x
960206	0100	0.73	0.093	0.093	10.72	10.72	-6.0	-6.0	-4.5	26.0	25.5	27.2	0.09
960206	0400	0.64	0.083	0.093	11.98	10.72	-6.0	-4.0	-2.2	27.5	26.8	33.1	0.18
960206	0700	0.58	0.093	0.093	10.72	10.72	4.0	2.0	2.4	27.9	27.5	23.5	0.19
960206	1000	0.55	0.093	0.093	10.72	10.72	-4.0	-2.0	5.3	32.3	28.5	29.7	0.19
960206	1300	0.71	0.103	0.093	9.71	10.72	0.0	2.0	29.8	49.5	30.2	32.3	0.15
960206	1600	0.74	0.103	0.103	9.71	9.71	2.0	-4.0	18.6	46.4	27.2	25.8	0.14
960206	1900	0.75	0.093	0.093	10.72	10.72	0.0	-4.0	14.2	41.7	25.2	27.3	0.14
960206	2200	0.64	0.103	0.103	9.71	9.71	-2.0	-6.0	14.5	43.2	27.7	26.8	0.16
960207	0100	0.58	0.093	0.093	10.72	10.72	-6.0	-6.0	12.2	39.2	27.8	21.6	0.11
960207	0400	0.58	0.093	0.093	10.72	10.72	-6.0	16.0	6.3	38.1	26.4	28.1	0.14
960207	0700	0.59	0.103	0.093	9.71	10.72	-8.0	18.0	1.9	40.3	28.2	33.7	0.16
960207	1000	0.53	0.093	0.093	10.72	10.72	-32.0	22.0	-0.7	43.3	28.8	31.2	0.16
960207	1300	0.49	0.103	0.093	9.71	10.72	-8.0	-8.0	1.8	40.4	29.2	31.3	0.15
960207	1600	0.50	0.093	0.103	10.72	9.71	-28.0	-32.0	-6.7	37.5	31.8	31.2	0.16
960207	1900	0.50	0.103	0.103	9.71	9.71	-6.0	-10.0	-10.9	33.1	31.7	29.6	0.18
960207	2200	0.47	0.093	0.093	10.72	10.72	-32.0	-10.0	-17.8	31.2	31.8	29.9	0.21
960208	0100	0.45	0.093	0.103	10.72	9.71	-10.0	-32.0	-24.0	26.5	27.1	24.0	0.17
960208	0400	0.44	0.093	0.093	10.72	10.72	-32.0	-32.0	-26.0	27.2	27.0	25.3	0.16
960208	0700	0.42	0.093	0.093	10.72	10.72	-34.0	-34.0	-30.7	26.8	27.5	28.3	0.21
960208	1000	0.41	0.093	0.093	10.72	10.72	-34.0	-34.0	-34.1	26.3	25.9	24.8	0.23
960208	1300	0.38	0.093	0.093	10.72	10.72	-34.0	-32.0	-29.2	23.5	23.2	23.0	0.18
960208	1600	0.41	0.103	0.103	9.71	9.71	-30.0	-32.0	-31.3	23.6	23.3	24.4	0.18
960208	1900	0.40	0.093	0.093	10.72	10.72	-32.0	-34.0	-31.6	25.2	24.6	25.1	0.24
960208	2200	0.39	0.093	0.093	10.72	10.72	-34.0	-34.0	-31.3	24.4	22.7	23.2	0.25
960209	0100	0.40	0.093	0.093	10.72	10.72	-32.0	-32.0	-32.6	25.1	21.2	21.4	0.19
960209	0400	0.41	0.093	0.093	10.72	10.72	-32.0	-36.0	-35.7	28.2	23.4	26.3	0.17
960209	0700	0.43	0.142	0.093	7.04	10.72	-40.0	-34.0	-37.5	26.5	22.5	27.8	0.23
960209	1000	0.37	0.093	0.093	10.72	10.72	-34.0	-36.0	-39.9	29.4	24.9	27.1	0.24
960209	1300	0.33	0.093	0.093	10.72	10.72	-18.0	-32.0	-31.2	33.9	30.4	25.9	0.21
960209	1600	0.34	0.093	0.093	10.72	10.72	-6.0	-36.0	-27.8	33.4	29.4	26.0	0.17
960209	1900	0.38	0.093	0.093	10.72	10.72	-32.0	-34.0	-36.8	33.8	36.3	24.7	0.26
960209	2200	0.36	0.093	0.093	10.72	10.72	-34.0	-36.0	-34.8	29.6	31.6	22.8	0.22
960210	0100	0.44	0.103	0.093	9.71	10.72	-32.0	-32.0	6.3	64.9	33.0	25.9	0.18
960210	0400	0.43	0.093	0.093	10.72	10.72	-12.0	-32.0	9.0	57.4	29.6	23.7	0.14
960210	0700	0.40	0.103	0.093	9.71	10.72	-32.0	-34.0	-3.1	45.3	30.2	25.4	0.20
960210	1000	0.39	0.093	0.093	10.72	10.72	-34.0	-34.0	-7.5	50.0	31.4	29.5	0.21
960210	1300	0.38	0.093	0.093	10.72	10.72	-32.0	-32.0	-8.7	46.4	29.6	22.6	0.21
960210	1600	0.36	0.103	0.093	9.71	10.72	-32.0	-34.0	-13.6	41.9	30.7	26.1	0.14
960210	1900	0.36	0.103	0.093	9.71	10.72	-32.0	-32.0	-14.1	41.7	27.6	27.8	0.22
960210	2200	0.34	0.093	0.093	10.72	10.72	-34.0	-32.0	-21.8	40.8	27.2	27.9	0.22
960211	0100	0.32	0.103	0.093	9.71	10.72	-32.0	-32.0	-26.6	30.8	30.0	29.0	0.25
960211	0400	0.30	0.093	0.093	10.72	10.72	-30.0	-30.0	-28.2	27.7	25.9	22.4	0.19
960211	0700	0.30	0.093	0.093	10.72	10.72	-32.0	-34.0	-36.3	29.7	23.2	23.0	0.28
960211	1000	0.32	0.103	0.093	9.71	10.72	-32.0	-34.0	-38.7	32.0	20.0	28.7	0.27
960211	1300	0.34	0.142	0.093	7.04	10.72	-38.0	-34.0	-37.6	25.0	16.8	26.6	0.26
960211	1600	0.33	0.142	0.093	7.04	10.72	-40.0	-40.0	-38.1	30.2	17.1	25.4	0.19
960211	1900	0.35	0.142	0.132	7.04	7.56	-40.0	-40.0	-34.7	31.6	22.6	12.9	0.25
960211	2200	0.37	0.132	0.132	7.56	7.56	-42.0	-40.0	-18.7	44.9	33.2	9.1	0.29
960212	0100	0.35	0.132	0.132	7.56	7.56	-40.0	-40.0	-15.8	53.2	25.7	9.3	0.29
960212	0400	0.32	0.308	0.093	3.25	10.72	64.0	62.0	2.8	92.3	24.9	34.1	0.30
960212	0700	0.29	0.298	0.074	3.35	13.56	60.0	60.0	3.9	81.8	25.5	22.0	0.30
960212	1000	0.65	0.240	0.240	4.17	4.17	54.0	56.0	43.1	25.0	15.8	10.3	0.23
960212	1300	1.04	0.171	0.181	5.83	5.52	46.0	48.0	46.7	24.3	19.9	11.5	0.14
960212	1600	1.02	0.162	0.171	6.19	5.83	36.0	44.0	48.2	27.6	21.8	14.9	0.11

(Sheet 25 of 54)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
960212	1900	0.83	0.171	0.162	5.83	6.19	42.0	42.0	35.1	20.3	17.6	14.4	0.14
960212	2200	1.29	0.152	0.152	6.59	6.59	30.0	42.0	35.0	17.1	14.4	10.0	0.16
960213	0100	1.27	0.162	0.162	6.19	6.19	34.0	40.0	34.7	15.5	12.8	8.6	0.17
960213	0400	1.49	0.162	0.142	6.19	7.04	38.0	38.0	31.4	17.3	12.2	11.4	0.15
960213	0700	1.15	0.162	0.142	6.19	7.04	34.0	30.0	28.7	17.9	13.6	12.7	0.10
960213	1000	0.80	0.142	0.142	7.04	7.04	30.0	38.0	29.7	19.6	14.7	15.0	0.10
960213	1300	0.69	0.171	0.171	5.83	5.83	36.0	36.0	25.7	20.8	14.6	9.8	0.12
960213	1600	0.60	0.123	0.123	8.16	8.16	4.0	24.0	20.1	23.7	18.2	18.6	0.10
960213	1900	0.53	0.132	0.132	7.56	7.56	10.0	24.0	17.2	22.8	19.0	14.7	0.10
960213	2200	0.43	0.132	0.132	7.56	7.56	8.0	12.0	-12.6	55.1	27.5	16.2	0.22
960214	0100	0.38	0.250	0.269	4.01	3.72	-58.0	-62.0	-35.8	57.8	23.8	17.1	0.22
960214	0400	0.33	0.308	0.289	3.25	3.47	-60.0	-56.0	-37.9	40.2	22.9	12.8	0.26
960214	0700	0.35	0.240	0.240	4.17	4.17	-56.0	-58.0	-45.4	28.8	14.8	6.7	0.17
960214	1000	0.33	0.132	0.132	7.56	7.56	-38.0	-38.0	-37.3	27.6	15.0	9.7	0.19
960214	1300	0.35	0.132	0.132	7.56	7.56	-38.0	-38.0	-39.2	14.2	14.0	6.9	0.26
960214	1600	0.32	0.123	0.123	8.16	8.16	-38.0	-38.0	-38.4	19.3	17.4	7.4	0.26
960214	1900	0.29	0.123	0.123	8.16	8.16	-38.0	-38.0	-39.9	22.0	16.7	7.9	0.17
960214	2200	0.28	0.123	0.123	8.16	8.16	-38.0	-38.0	-41.0	25.3	18.6	8.4	0.21
960215	0100	0.27	0.123	0.123	8.16	8.16	-38.0	-38.0	-41.5	23.0	19.5	7.2	0.36
960215	0400	0.25	0.123	0.113	8.16	8.87	-40.0	-40.0	-41.3	28.9	22.2	30.2	0.35
960215	0700	0.26	0.123	0.103	8.16	9.71	-42.0	-40.0	-40.8	33.7	34.9	26.4	0.35
960215	1000	0.29	0.113	0.113	8.87	8.87	-36.0	-38.0	-39.5	31.0	34.7	18.6	0.27
960215	1300	0.33	0.103	0.103	9.71	9.71	-40.0	-40.0	-37.7	32.9	35.4	30.1	9.99
960215	1600	0.34	0.103	0.103	9.71	9.71	-38.0	-40.0	-22.8	41.7	33.7	26.5	0.32
960215	1900	0.38	0.113	0.113	8.87	8.87	-42.0	-40.0	-19.7	47.4	38.5	29.5	0.27
960215	2200	0.59	0.103	0.279	9.71	3.59	-36.0	-2.0	-5.8	34.7	26.4	23.8	0.13
960216	0100	1.03	0.201	0.201	4.98	4.98	38.0	36.0	10.9	41.6	34.3	32.2	0.10
960216	0400	1.21	0.181	0.181	5.52	5.52	4.0	4.0	5.3	46.3	41.9	33.4	0.11
960216	0700	1.48	0.171	0.162	5.83	6.19	16.0	2.0	17.3	36.4	33.2	29.1	0.11
960216	1000	1.73	0.142	0.152	7.04	6.59	2.0	-10.0	14.3	37.2	23.3	21.1	0.13
960216	1300	2.13	0.162	0.142	6.19	7.04	30.0	34.0	25.9	30.0	23.9	30.9	0.16
960216	1600	2.85	0.113	0.113	8.87	8.87	32.0	40.0	33.4	22.8	20.0	18.8	0.20
960216	1900	2.84	0.103	0.103	9.71	9.71	20.0	42.0	30.1	23.1	18.0	16.8	0.21
960216	2200	2.57	0.103	0.103	9.71	9.71	6.0	8.0	21.9	26.6	17.9	15.8	0.17
960217	0100	2.22	0.093	0.093	10.72	10.72	6.0	8.0	21.5	26.4	19.5	18.0	0.15
960217	0400	2.14	0.093	0.093	10.72	10.72	4.0	6.0	19.1	25.2	21.0	20.4	0.15
960217	0700	1.86	0.093	0.093	10.72	10.72	6.0	16.0	22.0	25.7	17.4	21.1	0.18
960217	1000	1.64	0.093	0.093	10.72	10.72	6.0	22.0	21.5	26.6	16.6	18.2	0.16
960217	1300	1.48	0.103	0.103	9.71	9.71	6.0	20.0	20.0	22.5	17.4	16.9	0.11
960217	1600	1.19	0.103	0.103	9.71	9.71	4.0	22.0	18.3	22.4	19.3	20.5	0.10
960217	1900	0.89	0.093	0.103	10.72	9.71	4.0	16.0	16.8	23.3	19.8	21.6	0.10
960217	2200	0.71	0.093	0.093	10.72	10.72	14.0	16.0	13.9	21.5	20.2	18.9	0.10
960218	0100	0.59	0.103	0.103	9.71	9.71	2.0	2.0	5.0	20.7	22.9	17.9	0.16
960218	0400	0.51	0.103	0.103	9.71	9.71	4.0	6.0	2.0	26.7	24.6	19.3	0.23
960218	0700	0.40	0.113	0.113	8.87	8.87	4.0	4.0	-0.2	31.7	31.6	20.1	0.24
960218	1000	0.46	0.113	0.113	8.87	8.87	6.0	6.0	30.1	58.4	25.6	15.2	0.28
960218	1300	0.67	0.230	0.269	4.35	3.72	56.0	54.0	41.5	47.8	28.1	30.1	0.22
960218	1600	0.57	0.132	0.240	7.56	4.17	-42.0	90.0	38.2	55.6	35.9	35.9	0.23
960218	1900	0.50	0.191	0.181	5.24	5.52	46.0	36.0	26.9	48.4	35.0	20.9	0.18
960218	2200	0.39	0.210	0.103	4.75	9.71	46.0	46.0	14.4	51.1	32.9	24.5	0.14
960219	0100	0.36	0.132	0.113	7.56	8.87	-38.0	8.0	6.6	44.5	35.4	31.5	0.12
960219	0400	0.40	0.132	0.123	7.56	8.16	-36.0	-2.0	-4.0	44.2	35.1	30.9	0.20
960219	0700	0.55	0.298	0.289	3.35	3.47	-26.0	-14.0	-11.9	38.8	31.1	22.8	0.20

Appendix A Table of Collection Times and Bulk Parameters

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
960219	1000	0.57	0.289	0.269	3.47	3.72	-32.0	-30.0	-15.3	36.7	32.4	30.7	0.18
960219	1300	0.66	0.220	0.230	4.54	4.35	-38.0	-22.0	-26.5	35.5	32.8	30.0	0.14
960219	1600	0.67	0.074	0.220	13.56	4.54	10.0	-22.0	-24.5	34.5	31.0	28.5	0.19
960219	1900	0.66	0.074	0.210	13.56	4.75	8.0	-4.0	-17.0	38.1	35.3	40.7	0.17
960219	2200	0.79	0.181	0.181	5.52	5.52	-32.0	-32.0	-24.7	36.2	27.2	14.9	0.14
960220	0100	1.00	0.142	0.142	7.04	7.04	-24.0	-28.0	-26.2	23.2	20.6	16.0	0.09
960220	0400	1.27	0.132	0.132	7.56	7.56	-26.0	-26.0	-28.6	20.3	20.7	14.0	0.13
960220	0700	1.39	0.123	0.123	8.16	8.16	-34.0	-32.0	-32.6	24.0	24.4	18.2	0.14
960220	1000	1.35	0.113	0.113	8.87	8.87	-36.0	-38.0	-35.2	27.9	27.2	20.5	0.14
960220	1300	1.23	0.123	0.123	8.16	8.16	-38.0	-38.0	-32.3	30.2	28.8	18.8	0.12
960220	1600	1.25	0.123	0.123	8.16	8.16	-34.0	-34.0	-34.8	25.5	26.0	19.4	0.13
960220	1900	1.31	0.132	0.123	7.56	8.16	-34.0	-34.0	-31.2	31.3	31.6	25.1	0.13
960220	2200	1.15	0.113	0.123	8.87	8.16	-34.0	-34.0	-23.8	35.5	35.6	27.6	0.13
960221	0100	1.02	0.113	0.123	8.87	8.16	-10.0	-10.0	-22.0	33.5	32.7	28.0	0.11
960221	0400	1.07	0.123	0.132	8.16	7.56	0.0	-6.0	-25.4	37.4	33.6	30.8	0.12
960221	0700	1.09	0.132	0.132	7.56	7.56	-42.0	-2.0	-22.5	40.4	39.0	39.9	0.11
960221	1000	1.20	0.113	0.113	8.87	8.87	-6.0	-2.0	-15.8	35.1	34.3	24.1	0.11
960221	1300	1.23	0.113	0.113	8.87	8.87	-4.0	-2.0	-14.5	31.6	30.5	26.6	0.11
960221	1600	1.23	0.123	0.123	8.16	8.16	-14.0	-2.0	-21.1	34.4	33.2	27.8	0.10
960221	1900	1.23	0.132	0.123	7.56	8.16	-42.0	-38.0	-20.9	38.2	31.6	29.9	0.11
960221	2200	1.05	0.132	0.103	7.56	9.71	-36.0	-2.0	-13.8	39.0	33.4	28.0	0.12
960222	0100	1.00	0.103	0.103	9.71	9.71	4.0	-2.0	-12.6	34.3	32.1	26.8	0.11
960222	0400	1.02	0.113	0.103	8.87	9.71	0.0	-4.0	-8.9	32.9	30.1	29.1	0.11
960222	0700	1.04	0.113	0.103	8.87	9.71	-2.0	-2.0	-9.0	31.7	31.4	31.7	0.14
960222	1000	1.01	0.103	0.093	9.71	10.72	0.0	0.0	-8.5	35.0	33.3	31.9	0.13
960222	1300	0.98	0.093	0.093	10.72	10.72	4.0	-8.0	-9.0	32.8	32.7	29.5	0.11
960222	1600	1.05	0.103	0.103	9.71	9.71	-6.0	-6.0	-12.5	31.3	31.0	26.5	0.10
960222	1900	1.09	0.103	0.093	9.71	10.72	-2.0	-4.0	-7.7	33.6	33.3	32.0	0.12
960222	2200	1.01	0.093	0.093	10.72	10.72	-4.0	-4.0	-11.4	33.9	33.4	32.3	0.12
960223	0100	0.99	0.093	0.093	10.72	10.72	-2.0	-4.0	-9.1	33.7	33.6	32.0	0.11
960223	0400	1.01	0.093	0.103	10.72	9.71	-32.0	-8.0	-17.4	33.0	31.4	28.6	0.10
960223	0700	0.97	0.093	0.093	10.72	10.72	8.0	-2.0	-10.2	34.4	32.7	31.1	0.13
960223	1000	0.96	0.083	0.103	11.98	9.71	-2.0	-2.0	-8.2	34.8	34.7	34.7	0.13
960223	1300	0.91	0.093	0.093	10.72	10.72	-2.0	-2.0	-15.3	33.2	33.6	29.0	0.12
960223	1600	0.87	0.103	0.103	9.71	9.71	0.0	-2.0	-11.3	33.8	35.1	30.3	0.10
960223	1900	0.90	0.103	0.093	9.71	10.72	-2.0	0.0	-4.9	32.6	33.0	29.5	0.12
960223	2200	0.87	0.103	0.103	9.71	9.71	-4.0	-2.0	-10.0	33.2	34.2	28.7	0.14
960224	0100	0.89	0.093	0.093	10.72	10.72	0.0	0.0	-4.6	33.3	32.8	28.5	0.13
960224	0400	0.79	0.093	0.093	10.72	10.72	8.0	-2.0	-9.1	34.1	31.4	30.2	0.11
960224	0700	0.78	0.103	0.103	9.71	9.71	6.0	0.0	-8.6	34.4	32.9	29.3	0.14
960224	1000	0.71	0.103	0.103	9.71	9.71	0.0	-2.0	-16.2	34.5	31.7	29.2	0.15
960224	1300	0.68	0.093	0.083	10.72	11.98	0.0	-2.0	-13.5	41.7	32.7	35.1	0.16
960224	1600	0.65	0.289	0.093	3.47	10.72	52.0	0.0	-4.9	40.0	30.7	32.3	0.17
960224	1900	0.60	0.083	0.093	11.98	10.72	-2.0	-2.0	-4.6	35.6	31.2	30.2	0.14
960224	2200	0.54	0.093	0.093	10.72	10.72	2.0	2.0	-7.0	34.3	34.4	30.3	0.16
960225	0100	0.47	0.083	0.083	11.98	11.98	-2.0	-2.0	-6.2	34.9	36.7	29.4	0.18
960225	0400	0.43	0.083	0.093	11.98	10.72	-4.0	-4.0	-17.1	33.5	37.1	29.6	0.16
960225	0700	0.35	0.083	0.083	11.98	11.98	-6.0	-8.0	-11.8	36.0	34.2	34.3	0.17
960225	1000	0.32	0.083	0.083	11.98	11.98	-8.0	-6.0	-11.2	33.0	32.1	28.0	0.20
960225	1300	0.29	0.083	0.083	11.98	11.98	-36.0	-32.0	-20.7	33.8	34.6	31.8	0.21
960225	1600	0.26	0.083	0.083	11.98	11.98	0.0	-32.0	-19.3	32.5	31.9	32.6	0.18
960225	1900	0.24	0.093	0.093	10.72	10.72	-32.0	-32.0	-24.9	28.4	28.9	27.4	0.20
960225	2200	0.21	0.083	0.083	11.98	11.98	-12.0	-34.0	-21.6	31.4	28.5	29.8	0.26

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{JDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
960226	0100	0.21	0.083	0.083	11.98	11.98	-36.0	-34.0	-36.1	31.5	23.0	31.2	0.27
960226	0400	0.20	0.083	0.083	11.98	11.98	-8.0	-32.0	-25.1	31.8	23.9	26.8	0.23
960226	0700	0.19	0.083	0.083	11.98	11.98	-32.0	-32.0	-34.5	27.1	22.3	21.4	0.20
960226	1000	0.20	0.083	0.083	11.98	11.98	-10.0	-48.0	-34.1	37.9	23.6	25.0	0.22
960226	1300	0.25	0.191	0.083	5.24	11.98	-52.0	-52.0	-42.7	46.7	33.0	29.7	0.20
960226	1600	0.27	0.210	0.083	4.75	11.98	-54.0	-54.0	-42.9	44.9	28.6	26.9	0.19
960226	1900	0.24	0.083	0.083	11.98	11.98	-32.0	-52.0	-34.2	50.2	42.2	29.4	0.18
960226	2200	0.24	0.083	0.083	11.98	11.98	-34.0	-34.0	-28.4	46.9	44.9	32.5	0.21
960227	0100	0.26	0.083	0.083	11.98	11.98	4.0	6.0	-19.5	49.1	46.4	37.2	0.18
960227	0400	0.28	0.093	0.083	10.72	11.98	12.0	8.0	-8.0	40.8	41.1	35.1	0.20
960227	0700	0.31	0.083	0.083	11.98	11.98	2.0	-12.0	-13.0	35.5	38.9	27.4	0.17
960227	1000	0.32	0.103	0.083	9.71	11.98	0.0	0.0	-7.4	32.7	33.0	30.3	0.17
960227	1300	0.37	0.093	0.093	10.72	10.72	2.0	-2.0	-14.5	34.9	33.0	25.4	0.22
960227	1600	0.38	0.103	0.103	9.71	9.71	2.0	0.0	-14.6	33.7	33.5	24.0	0.21
960227	1900	0.39	0.103	0.103	9.71	9.71	0.0	-2.0	-8.6	33.0	33.5	20.7	0.20
960227	2200	0.41	0.113	0.103	8.87	9.71	0.0	-2.0	-9.5	32.4	32.1	26.9	0.20
960228	0100	0.46	0.113	0.103	8.87	9.71	-4.0	-4.0	-14.9	30.7	29.0	21.9	0.25
960228	0400	0.44	0.103	0.103	9.71	9.71	0.0	-4.0	-14.8	35.6	29.8	22.4	0.23
960228	0700	0.44	0.113	0.103	8.87	9.71	-2.0	2.0	-9.9	39.1	29.5	27.6	0.20
960228	1000	0.45	0.113	0.113	8.87	8.87	-2.0	-2.0	-22.0	38.6	32.1	24.1	0.19
960228	1300	0.44	0.113	0.113	8.87	8.87	6.0	0.0	-22.2	48.9	31.7	27.1	0.25
960228	1600	0.40	0.103	0.103	9.71	9.71	0.0	0.0	-22.3	43.3	30.6	23.4	0.28
960228	1900	0.37	0.074	0.074	13.56	13.56	-12.0	-8.0	-21.5	37.0	29.9	23.5	0.33
960228	2200	0.34	0.074	0.074	13.56	13.56	-4.0	-2.0	-19.2	40.0	34.0	20.6	0.34
960229	0100	0.89	0.269	0.269	3.72	3.72	54.0	54.0	43.3	19.0	18.3	14.8	0.29
960229	0400	1.80	0.201	0.162	4.98	6.19	46.0	46.0	42.9	18.8	17.5	15.3	0.23
960229	0700	1.66	0.152	0.142	6.59	7.04	38.0	40.0	37.9	22.1	17.4	15.8	0.20
960229	1000	1.47	0.132	0.132	7.56	7.56	22.0	24.0	32.2	24.7	17.7	15.3	0.17
960229	1300	1.21	0.142	0.142	7.04	7.04	24.0	26.0	32.0	23.3	18.9	12.9	0.14
960229	1600	0.91	0.152	0.162	6.59	6.19	28.0	26.0	30.7	23.2	19.7	16.2	0.12
960229	1900	0.83	0.171	0.171	5.83	5.83	38.0	32.0	35.5	28.4	20.3	15.5	0.09
960229	2200	0.60	0.181	0.152	5.52	6.59	38.0	38.0	26.9	24.9	17.8	15.8	0.08
960301	0100	0.51	0.152	0.152	6.59	6.59	20.0	22.0	25.8	24.4	19.7	9.1	0.10
960301	0400	0.50	0.162	0.152	6.19	6.59	16.0	16.0	20.0	25.0	21.8	13.4	0.12
960301	0700	0.51	0.162	0.162	6.19	6.19	12.0	14.0	24.8	28.0	23.3	16.0	0.12
960301	1000	0.53	0.171	0.162	5.83	6.19	16.0	16.0	23.0	29.3	24.7	15.2	0.10
960301	1300	0.59	0.171	0.210	5.83	4.75	18.0	18.0	28.3	36.9	30.4	22.7	0.10
960301	1600	0.66	0.230	0.259	4.35	3.86	44.0	48.0	32.3	42.3	30.3	28.6	0.14
960301	1900	0.59	0.230	0.259	4.35	3.86	40.0	42.0	24.7	51.7	34.8	36.6	0.12
960301	2200	0.60	0.269	0.259	3.72	3.86	40.0	38.0	21.5	49.6	39.9	43.6	0.12
960302	0100	0.76	0.259	0.230	3.86	4.35	32.0	32.0	20.3	43.4	32.8	41.6	0.09
960302	0400	1.20	0.162	0.201	6.19	4.98	-24.0	22.0	11.7	55.5	25.7	26.6	0.14
960302	0700	1.60	0.123	0.123	8.16	8.16	-20.0	-16.0	5.9	47.6	23.9	19.4	0.13
960302	1000	1.53	0.113	0.113	8.87	8.87	-18.0	-16.0	8.5	43.0	22.3	22.3	0.10
960302	1300	1.44	0.113	0.113	8.87	8.87	-8.0	-6.0	9.7	31.0	22.0	18.1	0.10
960302	1600	1.30	0.132	0.132	7.56	7.56	4.0	-4.0	15.9	32.3	22.8	18.6	0.09
960302	1900	1.15	0.132	0.123	7.56	8.16	30.0	16.0	21.0	32.4	28.8	32.7	0.08
960302	2200	1.07	0.123	0.123	8.16	8.16	10.0	14.0	17.4	27.0	26.4	26.9	0.07
960303	0100	0.91	0.123	0.123	8.16	8.16	6.0	6.0	10.3	23.2	25.2	15.7	0.08
960303	0400	0.78	0.123	0.113	8.16	8.87	2.0	6.0	7.4	27.4	28.9	28.4	0.12
960303	0700	0.63	0.123	0.113	8.16	8.87	0.0	4.0	1.4	36.3	35.5	37.3	0.14
960303	1000	0.52	0.113	0.113	8.87	8.87	0.0	0.0	-9.7	32.6	31.6	26.0	0.11
960303	1300	0.41	0.123	0.113	8.16	8.87	2.0	0.0	-3.5	38.2	37.9	32.4	0.12
960303	1600	0.59	0.250	0.123	4.01	8.16	56.0	56.0	24.4	63.5	24.6	44.2	0.23

(Sheet 28 of 54)

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
960303	1900	1.21	0.230	0.230	4.35	4.35	50.0	52.0	45.5	16.8	15.7	7.6	0.25
960303	2200	1.58	0.142	0.142	7.04	7.04	28.0	40.0	37.6	20.3	16.3	10.8	0.18
960304	0100	1.37	0.142	0.152	7.04	6.59	24.0	26.0	36.3	26.1	17.8	14.2	0.17
960304	0400	1.29	0.142	0.142	7.04	7.04	32.0	34.0	37.9	29.9	22.8	18.9	0.16
960304	0700	1.19	0.152	0.152	6.59	6.59	30.0	30.0	38.6	26.3	25.0	15.0	0.13
960304	1000	1.05	0.152	0.152	6.59	6.59	22.0	24.0	31.6	23.1	22.6	13.2	0.09
960304	1300	0.84	0.162	0.152	6.19	6.59	24.0	26.0	26.5	24.5	24.8	15.2	0.09
960304	1600	0.68	0.171	0.171	5.83	5.83	26.0	26.0	19.7	26.0	24.7	12.8	0.11
960304	1900	0.51	0.162	0.171	6.19	5.83	24.0	20.0	13.9	33.4	26.9	17.7	0.11
960304	2200	0.43	0.162	0.162	6.19	6.19	22.0	18.0	6.5	38.8	27.1	12.7	0.09
960305	0100	0.37	0.171	0.142	5.83	7.04	18.0	-24.0	-2.6	42.6	33.1	27.8	0.09
960305	0400	0.37	0.152	0.142	6.59	7.04	-20.0	-22.0	-19.5	30.5	31.2	25.9	0.15
960305	0700	0.35	0.123	0.113	8.16	8.87	-14.0	-18.0	-21.3	27.1	26.6	20.3	0.17
960305	1000	0.31	0.113	0.113	8.87	8.87	-12.0	-12.0	-19.7	23.0	22.3	15.8	0.12
960305	1300	0.35	0.132	0.132	7.56	7.56	-14.0	-16.0	-29.6	29.8	19.5	15.2	0.11
960305	1600	0.59	0.132	0.162	7.56	6.19	-34.0	-46.0	-40.1	22.4	16.1	15.8	0.18
960305	1900	0.68	0.142	0.142	7.04	7.04	-38.0	-40.0	-42.1	16.7	13.5	11.1	0.17
960305	2200	0.64	0.132	0.123	7.56	8.16	-36.0	-38.0	-41.3	15.0	11.0	14.3	0.17
960306	0100	0.62	0.132	0.132	7.56	7.56	-36.0	-40.0	-41.0	13.3	9.1	8.3	0.14
960306	0400	0.66	0.142	0.132	7.04	7.56	-38.0	-38.0	-41.7	12.9	10.3	8.6	0.16
960306	0700	0.68	0.142	0.132	7.04	7.56	-42.0	-42.0	-43.0	14.2	12.9	10.5	0.17
960306	1000	0.58	0.123	0.123	8.16	8.16	-36.0	-38.0	-42.9	17.1	15.3	14.8	0.14
960306	1300	0.54	0.132	0.132	7.56	7.56	-38.0	-38.0	-43.3	17.0	15.3	12.8	0.13
960306	1600	0.65	0.142	0.113	7.04	8.87	-40.0	-38.0	-44.3	17.8	12.4	15.8	0.17
960306	1900	0.72	0.113	0.113	8.87	8.87	-36.0	-40.0	-44.8	16.9	11.2	11.6	0.17
960306	2200	0.71	0.113	0.113	8.87	8.87	-38.0	-38.0	-42.8	18.4	14.9	14.8	0.19
960307	0100	0.66	0.113	0.113	8.87	8.87	-34.0	-36.0	-42.0	18.4	17.3	12.0	0.15
960307	0400	0.61	0.093	0.093	10.72	10.72	-34.0	-38.0	-42.7	17.6	17.8	12.0	0.19
960307	0700	0.70	0.093	0.093	10.72	10.72	-38.0	-38.0	-39.4	18.4	19.4	18.0	0.19
960307	1000	0.77	0.103	0.093	9.71	10.72	-36.0	-38.0	-33.7	23.9	27.0	23.0	0.21
960307	1300	0.84	0.093	0.093	10.72	10.72	-34.0	-36.0	-25.6	25.4	40.5	18.4	0.15
960307	1600	0.79	0.103	0.103	9.71	9.71	-36.0	-38.0	-30.4	37.0	40.7	19.9	0.19
960307	1900	1.21	0.220	0.220	4.54	4.54	48.0	48.0	28.0	53.9	23.3	8.5	0.21
960307	2200	1.33	0.181	0.191	5.52	5.24	44.0	52.0	37.2	26.1	19.8	14.3	0.26
960308	0100	1.20	0.191	0.191	5.24	5.24	40.0	38.0	30.1	33.9	22.6	15.6	0.23
960308	0400	1.52	0.162	0.191	6.19	5.24	24.0	54.0	34.5	28.9	19.4	17.9	0.24
960308	0700	1.52	0.171	0.162	5.83	6.19	38.0	34.0	35.2	24.7	17.5	14.9	0.24
960308	1000	1.34	0.171	0.142	5.83	7.04	38.0	36.0	32.8	21.0	16.6	14.5	0.20
960308	1300	1.17	0.152	0.152	6.59	6.59	22.0	30.0	27.3	23.8	16.1	12.0	0.16
960308	1600	1.02	0.171	0.171	5.83	5.83	36.0	36.0	29.9	24.9	16.5	9.1	0.13
960308	1900	0.94	0.181	0.113	5.52	8.87	42.0	54.0	30.1	32.0	18.2	28.8	0.17
960308	2200	0.98	0.181	0.123	5.52	8.16	40.0	50.0	33.0	30.6	14.0	17.0	0.19
960309	0100	1.09	0.162	0.162	6.19	6.19	34.0	42.0	36.0	25.0	13.7	10.1	0.20
960309	0400	1.22	0.171	0.171	5.83	5.83	38.0	40.0	40.6	24.3	14.0	8.1	0.23
960309	0700	1.18	0.171	0.152	5.83	6.59	42.0	36.0	37.3	23.8	17.7	13.5	0.18
960309	1000	1.02	0.142	0.142	7.04	7.04	24.0	26.0	32.4	22.1	16.9	8.5	0.15
960309	1300	0.88	0.142	0.152	7.04	6.59	22.0	26.0	28.4	22.7	18.7	14.8	0.12
960309	1600	0.78	0.152	0.162	6.59	6.19	22.0	22.0	28.3	23.5	19.6	13.6	0.10
960309	1900	0.74	0.181	0.171	5.52	5.83	30.0	28.0	25.7	24.9	21.2	12.2	0.11
960309	2200	0.73	0.171	0.171	5.83	5.83	30.0	30.0	32.1	27.2	22.8	9.3	0.15
960310	0100	0.85	0.210	0.250	4.75	4.01	42.0	42.0	38.2	27.2	21.1	20.8	0.18
960310	0400	1.19	0.171	0.181	5.83	5.52	32.0	38.0	38.5	24.0	20.8	16.4	0.14
960310	0700	1.26	0.171	0.171	5.83	5.83	44.0	44.0	35.3	28.2	25.4	24.3	0.13

(Sheet 29 of 54)

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
960310	1000	1.21	0.162	0.171	6.19	5.83	22.0	24.0	34.8	28.3	25.7	21.8	0.14
960310	1300	1.17	0.171	0.171	5.83	5.83	38.0	34.0	33.6	32.3	26.2	23.3	0.16
960310	1600	1.57	0.162	0.171	6.19	5.83	20.0	22.0	30.4	27.9	24.9	19.6	0.13
960310	1900	1.77	0.171	0.162	5.83	6.19	20.0	18.0	24.9	29.2	25.6	20.4	0.12
960310	2200	1.66	0.162	0.162	6.19	6.19	16.0	18.0	19.8	32.0	26.8	19.0	0.14
960311	0100	1.65	0.162	0.162	6.19	6.19	-2.0	-2.0	19.7	38.0	26.4	25.2	0.12
960311	0400	1.73	0.171	0.171	5.83	5.83	20.0	-4.0	16.7	36.5	24.0	20.6	0.12
960311	0700	1.99	0.162	0.162	6.19	6.19	12.0	10.0	19.5	36.4	24.2	18.3	0.15
960311	1000	2.50	0.152	0.142	6.59	7.04	30.0	32.0	23.1	34.0	23.3	23.2	0.16
960311	1300	2.95	0.142	0.142	7.04	7.04	20.0	2.0	19.4	36.0	21.3	18.7	0.18
960311	1600	3.19	0.093	0.093	10.72	10.72	-14.0	-2.0	10.9	33.3	23.5	13.2	0.15
960311	1900	3.15	0.103	0.103	9.71	9.71	2.0	4.0	19.7	35.6	25.0	17.5	0.17
960311	2200	3.55	0.103	0.093	9.71	10.72	2.0	2.0	17.3	32.6	24.0	18.7	0.16
960312	0100	3.53	0.093	0.093	10.72	10.72	-2.0	-2.0	11.7	34.0	25.8	18.4	0.14
960312	0400	3.51	0.083	0.083	11.98	11.98	-2.0	-4.0	7.1	33.4	27.3	21.1	0.12
960312	0700	3.80	0.074	0.083	13.56	11.98	-14.0	-10.0	-3.1	30.5	28.1	17.7	0.10
960312	1000	4.01	0.074	0.083	13.56	11.98	-12.0	-10.0	-5.1	25.2	25.6	16.9	0.10
960312	1300	3.66	0.074	0.074	13.56	13.56	-12.0	-12.0	3.1	29.8	26.9	10.4	0.10
960312	1600	3.34	0.074	0.083	13.56	11.98	-12.0	-12.0	5.0	28.4	24.6	16.9	0.10
960312	1900	3.15	0.083	0.083	11.98	11.98	2.0	2.0	0.6	25.5	25.1	20.2	0.09
960312	2200	2.83	0.074	0.083	13.56	11.98	-2.0	2.0	2.9	22.6	23.4	19.8	0.09
960313	0100	2.56	0.074	0.074	13.56	13.56	-8.0	4.0	3.1	23.9	24.0	15.6	0.09
960313	0400	2.31	0.083	0.083	11.98	11.98	6.0	2.0	3.6	25.0	25.1	25.9	0.09
960313	0700	2.23	0.083	0.083	11.98	11.98	6.0	4.0	3.0	22.3	22.6	20.2	0.09
960313	1000	2.22	0.083	0.083	11.98	11.98	4.0	4.0	4.1	20.0	21.0	16.4	0.09
960313	1300	1.99	0.083	0.083	11.98	11.98	6.0	6.0	4.5	21.7	22.3	17.1	0.09
960313	1600	1.69	0.083	0.083	11.98	11.98	8.0	6.0	4.9	23.3	23.9	22.3	0.09
960313	1900	1.74	0.083	0.083	11.98	11.98	6.0	4.0	4.9	23.7	24.4	20.7	0.08
960313	2200	1.57	0.083	0.083	11.98	11.98	8.0	4.0	4.9	24.4	25.0	20.3	0.09
960314	0100	1.42	0.093	0.093	10.72	10.72	6.0	6.0	5.7	25.7	26.5	21.3	0.11
960314	0400	1.28	0.093	0.093	10.72	10.72	10.0	6.0	5.9	25.7	26.1	24.0	0.12
960314	0700	1.18	0.093	0.093	10.72	10.72	8.0	4.0	5.3	24.6	25.6	23.6	0.08
960314	1000	1.09	0.093	0.093	10.72	10.72	6.0	6.0	4.1	26.6	27.3	22.9	0.10
960314	1300	1.06	0.093	0.093	10.72	10.72	8.0	6.0	4.6	27.9	27.6	23.3	0.13
960314	1600	1.02	0.093	0.093	10.72	10.72	6.0	4.0	2.8	27.4	27.6	24.8	0.13
960314	1900	0.86	0.093	0.093	10.72	10.72	4.0	4.0	1.3	27.2	27.4	21.5	0.10
960314	2200	0.91	0.103	0.103	9.71	9.71	6.0	4.0	2.5	26.9	26.2	21.3	0.12
960315	0100	0.80	0.103	0.103	9.71	9.71	6.0	6.0	0.8	31.4	29.0	23.8	0.15
960315	0400	0.71	0.093	0.103	10.72	9.71	10.0	8.0	0.8	34.4	31.8	30.1	0.18
960315	0700	0.65	0.103	0.103	9.71	9.71	6.0	6.0	0.9	29.7	27.8	22.2	0.13
960315	1000	0.65	0.103	0.103	9.71	9.71	4.0	4.0	-1.3	33.0	30.7	28.1	0.13
960315	1300	0.63	0.103	0.103	9.71	9.71	4.0	4.0	-2.8	36.0	30.3	28.4	0.18
960315	1600	0.62	0.093	0.093	10.72	10.72	6.0	6.0	-8.5	43.1	31.6	29.2	0.17
960315	1900	0.59	0.103	0.103	9.71	9.71	4.0	4.0	-10.0	40.4	32.0	24.9	0.16
960315	2200	0.57	0.132	0.093	7.56	10.72	-40.0	-40.0	-13.5	43.3	30.3	25.9	0.13
960316	0100	0.60	0.123	0.103	8.16	9.71	-40.0	-42.0	-23.4	44.6	29.9	36.6	0.15
960316	0400	0.56	0.123	0.103	8.16	9.71	-42.0	-44.0	-22.2	47.2	34.2	42.5	0.20
960316	0700	0.65	0.123	0.103	8.16	9.71	-44.0	-46.0	-13.4	57.7	28.7	40.1	0.15
960316	1000	0.56	0.123	0.103	8.16	9.71	-40.0	-46.0	-10.3	52.5	32.7	30.5	0.10
960316	1300	0.60	0.103	0.103	9.71	9.71	8.0	8.0	-2.2	48.6	46.6	36.3	0.15
960316	1900	0.75	0.152	0.093	6.59	10.72	10.0	10.0	11.3	27.4	24.9	31.7	0.12
960316	2200	0.69	0.152	0.093	6.59	10.72	10.0	10.0	13.9	32.8	27.5	33.8	0.09
960317	0100	0.84	0.152	0.103	6.59	9.71	8.0	10.0	-1.7	50.9	42.8	38.8	0.12

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	x
960317	0400	1.29	0.201	0.201	4.98	4.98	32.0	32.0	22.8	31.4	30.4	20.3	0.11
960317	0700	1.23	0.181	0.181	5.52	5.52	10.0	12.0	12.6	32.1	30.2	23.1	0.08
960317	1000	1.12	0.171	0.171	5.83	5.83	-34.0	-8.0	-6.8	43.1	35.6	35.6	0.07
960317	1300	1.02	0.171	0.171	5.83	5.83	-18.0	-16.0	-8.9	35.4	30.9	23.6	0.09
960317	1600	0.99	0.171	0.171	5.83	5.83	-14.0	-14.0	-2.0	36.0	30.8	27.4	0.09
960317	1900	0.88	0.181	0.171	5.52	5.83	10.0	8.0	4.6	31.5	26.7	22.1	0.10
960317	2200	0.80	0.181	0.171	5.52	5.83	8.0	6.0	5.6	27.5	24.6	17.0	0.10
960318	0100	0.81	0.162	0.162	6.19	6.19	-2.0	0.0	7.3	25.2	25.0	17.4	0.09
960318	0400	0.76	0.171	0.171	5.83	5.83	-2.0	0.0	6.1	26.5	25.9	14.4	0.13
960318	0700	0.68	0.162	0.162	6.19	6.19	4.0	2.0	8.3	27.6	26.7	13.4	0.13
960318	1000	0.65	0.162	0.113	6.19	8.87	-2.0	0.0	7.8	29.2	26.0	23.6	0.10
960318	1300	0.63	0.123	0.123	8.16	8.16	-4.0	2.0	5.6	29.6	27.3	20.0	0.11
960318	1600	0.70	0.123	0.123	8.16	8.16	-6.0	8.0	7.4	35.9	26.5	22.4	0.12
960318	1900	0.72	0.230	0.230	4.35	4.35	10.0	10.0	9.7	36.0	27.6	13.6	0.13
960318	2200	0.74	0.230	0.230	4.35	4.35	22.0	-4.0	5.5	34.4	25.3	21.8	0.13
960319	0100	0.83	0.171	0.181	5.83	5.52	-6.0	-4.0	0.8	23.9	23.1	17.8	0.09
960319	0400	0.88	0.171	0.181	5.83	5.52	0.0	-2.0	0.7	20.6	21.0	18.4	0.09
960319	0700	0.88	0.162	0.162	6.19	6.19	0.0	-2.0	2.3	19.0	20.9	11.0	0.09
960319	1000	0.87	0.142	0.162	7.04	6.19	0.0	0.0	2.7	20.8	22.3	14.2	0.09
960319	1300	0.94	0.152	0.152	6.59	6.59	2.0	0.0	-9.1	38.8	34.3	13.4	0.14
960319	1600	1.01	0.171	0.191	5.83	5.24	-50.0	-50.0	-46.7	48.0	37.0	47.5	0.11
960319	1900	0.90	0.142	0.142	7.04	7.04	-46.0	-48.0	-47.0	24.7	20.9	13.1	0.12
960329	1600	1.35	0.103	0.103	9.71	9.71	10.0	14.0	20.6	25.2	18.1	19.7	0.13
960329	1900	1.78	0.093	0.093	10.72	10.72	12.0	14.0	21.0	22.7	16.6	16.9	0.16
960329	2200	2.30	0.093	0.093	10.72	10.72	12.0	12.0	22.3	24.1	18.7	16.0	0.16
960330	0100	2.28	0.093	0.093	10.72	10.72	12.0	12.0	18.7	24.2	20.9	19.2	0.15
960330	0400	2.21	0.083	0.083	11.98	11.98	8.0	10.0	15.4	26.1	22.0	20.3	0.14
960330	0700	2.30	0.083	0.083	11.98	11.98	6.0	8.0	5.4	25.6	23.4	22.3	0.10
960330	1000	2.52	0.074	0.083	13.56	11.98	-16.0	4.0	-0.4	23.2	20.6	21.7	0.09
960330	1300	2.15	0.074	0.083	13.56	11.98	-4.0	-4.0	4.6	23.7	21.6	25.3	0.09
960330	1600	1.90	0.074	0.083	13.56	11.98	-16.0	4.0	0.7	22.8	20.9	20.5	0.09
960330	1900	1.57	0.083	0.083	11.98	11.98	6.0	6.0	3.9	23.4	22.4	22.0	0.09
960330	2200	1.51	0.083	0.083	11.98	11.98	6.0	4.0	4.0	21.7	21.6	22.6	0.09
960331	0100	1.31	0.083	0.083	11.98	11.98	4.0	6.0	4.6	23.2	24.0	18.4	0.11
960331	0400	1.18	0.083	0.093	11.98	10.72	6.0	6.0	6.7	24.9	26.3	21.1	0.11
960331	0700	1.09	0.093	0.093	10.72	10.72	4.0	4.0	3.5	28.1	29.4	21.6	0.11
960331	1000	1.04	0.093	0.093	10.72	10.72	2.0	2.0	1.2	30.0	31.4	23.2	0.11
960331	1300	1.03	0.093	0.093	10.72	10.72	2.0	2.0	-2.0	30.1	31.4	21.5	0.12
960331	1600	0.98	0.093	0.093	10.72	10.72	2.0	2.0	2.3	30.7	32.4	24.1	0.12
960331	1900	0.92	0.093	0.093	10.72	10.72	-14.0	-8.0	-5.0	27.0	29.2	21.4	0.13
960331	2200	0.81	0.103	0.103	9.71	9.71	0.0	-4.0	-3.8	28.0	29.3	22.4	0.11
960401	0100	0.86	0.103	0.103	9.71	9.71	0.0	-2.0	-13.0	32.4	32.0	23.9	0.11
960401	0400	1.09	0.152	0.152	6.59	6.59	-44.0	-46.0	-29.6	36.6	27.9	21.0	0.09
960401	0700	1.34	0.132	0.123	7.56	8.16	-44.0	-42.0	-29.5	29.7	28.1	27.5	0.09
960401	1000	1.37	0.132	0.132	7.56	7.56	-40.0	-42.0	-27.6	28.3	26.6	22.9	0.09
960401	1300	1.54	0.123	0.123	8.16	8.16	-16.0	-16.0	-18.9	25.8	24.2	18.5	0.10
960401	1600	1.36	0.123	0.132	8.16	7.56	-6.0	-6.0	-15.5	30.3	27.3	26.5	0.09
960401	1900	1.16	0.103	0.103	9.71	9.71	0.0	-2.0	-13.5	33.4	30.4	17.3	0.10
960401	2200	1.06	0.113	0.113	8.87	8.87	-2.0	0.0	-14.2	35.3	32.1	22.4	0.09
960402	0100	1.49	0.318	0.113	3.15	8.87	46.0	46.0	25.7	47.4	16.3	28.5	0.29
960402	0400	1.55	0.298	0.318	3.35	3.15	48.0	48.0	34.0	21.8	14.5	10.1	0.32
960402	0700	1.70	0.152	0.152	6.59	6.59	38.0	40.0	36.4	11.0	9.9	6.0	0.24
960402	1000	1.55	0.162	0.152	6.19	6.59	38.0	38.0	34.4	15.6	12.4	9.1	0.18

(Sheet 31 of 54)

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
960402	1300	1.69	0.142	0.142	7.04	7.04	26.0	42.0	32.2	20.5	13.7	12.7	0.17
960402	1600	1.38	0.142	0.142	7.04	7.04	24.0	24.0	27.4	21.0	16.3	11.2	0.16
960402	1900	1.17	0.132	0.123	7.56	8.16	22.0	22.0	24.6	22.1	18.4	16.8	0.14
960402	2200	0.99	0.123	0.123	8.16	8.16	18.0	24.0	23.0	21.8	17.5	16.0	0.09
960403	0100	0.98	0.132	0.132	7.56	7.56	18.0	16.0	20.0	23.1	18.0	15.0	0.10
960403	0400	0.89	0.113	0.113	8.87	8.87	10.0	14.0	16.1	26.9	20.9	17.8	0.11
960403	0700	0.90	0.113	0.113	8.87	8.87	14.0	14.0	14.2	28.7	20.7	21.3	0.11
960403	1000	0.81	0.113	0.113	8.87	8.87	8.0	10.0	12.2	24.7	19.8	16.9	0.10
960403	1600	0.83	0.093	0.093	10.72	10.72	0.0	6.0	-9.0	33.2	29.4	18.5	0.14
960403	1900	0.65	0.103	0.093	9.71	10.72	4.0	2.0	-6.2	33.0	30.6	23.2	0.16
960403	2200	0.55	0.093	0.093	10.72	10.72	0.0	2.0	-9.6	31.2	26.2	19.7	0.14
960404	0100	0.48	0.093	0.093	10.72	10.72	0.0	-2.0	-15.6	33.8	26.3	19.9	0.14
960404	0400	0.45	0.093	0.093	10.72	10.72	0.0	0.0	-18.9	41.0	23.9	19.9	0.24
960404	0700	0.44	0.093	0.093	10.72	10.72	0.0	-46.0	-22.9	45.8	25.9	23.0	0.18
960404	1000	0.39	0.132	0.093	7.56	10.72	-44.0	-46.0	-24.5	45.9	24.6	18.8	0.17
960404	1300	0.42	0.142	0.093	7.04	10.72	-44.0	-44.0	-28.9	45.7	19.3	21.3	0.12
960404	1600	0.47	0.162	0.103	6.19	9.71	-48.0	-48.0	-37.8	41.2	15.9	25.0	0.18
960404	1900	0.50	0.201	0.093	4.98	10.72	-52.0	-52.0	-36.3	38.1	14.9	22.5	0.19
960404	2200	0.43	0.181	0.093	5.52	10.72	-50.0	-48.0	-33.3	40.7	17.3	21.5	0.21
960405	0100	0.36	0.162	0.103	6.19	9.71	-46.0	-46.0	-34.4	36.4	15.9	21.2	0.13
960405	0400	0.37	0.171	0.171	5.83	5.83	-46.0	-46.0	-34.9	33.1	15.8	4.6	0.18
960405	0700	0.38	0.152	0.142	6.59	7.04	-46.0	-48.0	-37.6	36.6	20.3	7.1	0.21
960405	1000	0.56	0.279	0.279	3.59	3.59	54.0	52.0	20.9	83.8	23.7	11.4	0.18
960405	1300	0.97	0.220	0.230	4.54	4.35	50.0	52.0	45.1	13.2	13.0	9.2	0.31
960405	1600	0.98	0.230	0.230	4.35	4.35	50.0	50.0	42.6	18.4	16.9	9.6	0.27
960405	1900	1.26	0.201	0.201	4.98	4.98	48.0	48.0	40.2	25.2	18.9	16.2	0.23
960405	2200	1.14	0.152	0.152	6.59	6.59	30.0	34.0	29.3	19.3	16.8	14.0	0.16
960406	0100	0.99	0.142	0.142	7.04	7.04	18.0	28.0	23.4	20.2	17.2	12.9	0.09
960406	0400	0.99	0.142	0.142	7.04	7.04	24.0	18.0	22.2	20.4	18.8	14.3	0.09
960406	0700	0.94	0.123	0.142	8.16	7.04	8.0	16.0	20.5	23.8	20.0	17.9	0.11
960406	1000	0.88	0.162	0.123	6.19	8.16	32.0	10.0	19.2	27.2	20.0	18.0	0.11
960406	1300	0.98	0.132	0.132	7.56	7.56	4.0	6.0	16.5	29.0	20.0	12.5	0.11
960406	1600	1.48	0.210	0.210	4.75	4.75	28.0	10.0	18.8	29.5	24.6	21.8	0.12
960406	1900	1.48	0.181	0.181	5.52	5.52	8.0	8.0	19.3	32.9	26.6	28.0	0.12
960406	2200	1.34	0.181	0.181	5.52	5.52	34.0	34.0	23.6	34.3	24.5	30.4	0.16
960407	0100	1.22	0.171	0.191	5.83	5.24	-4.0	-4.0	15.1	39.5	20.3	23.7	0.11
960407	0400	1.20	0.142	0.142	7.04	7.04	-4.0	-2.0	13.8	43.0	22.1	25.0	0.11
960407	0700	1.25	0.142	0.142	7.04	7.04	-2.0	-2.0	12.9	34.1	20.7	19.4	0.11
960407	1000	1.20	0.113	0.132	8.87	7.56	2.0	2.0	9.3	23.7	16.9	16.6	0.10
960407	1300	1.21	0.093	0.093	10.72	10.72	-8.0	0.0	7.2	22.1	15.3	12.1	0.11
960407	1600	1.16	0.113	0.123	8.87	8.16	2.0	6.0	11.2	20.2	16.1	13.6	0.11
960407	1900	1.19	0.113	0.113	8.87	8.87	4.0	6.0	12.4	21.9	17.8	15.3	0.12
960407	2200	1.10	0.103	0.103	9.71	9.71	10.0	10.0	15.4	25.2	18.8	20.0	0.13
960408	0100	1.01	0.103	0.103	9.71	9.71	10.0	10.0	14.8	20.5	16.9	15.3	0.11
960408	0400	1.07	0.113	0.113	8.87	8.87	10.0	10.0	14.1	20.8	15.7	13.2	0.10
960408	0700	1.02	0.113	0.113	8.87	8.87	10.0	12.0	19.2	22.2	17.6	13.7	0.11
960408	1000	0.98	0.113	0.113	8.87	8.87	14.0	20.0	20.7	23.9	18.8	17.6	0.13
960408	1300	0.93	0.113	0.113	8.87	8.87	12.0	14.0	21.6	23.0	18.1	12.4	0.10
960408	1600	1.04	0.093	0.093	10.72	10.72	12.0	10.0	11.1	20.0	20.4	13.0	0.10
960408	1900	0.99	0.093	0.093	10.72	10.72	10.0	10.0	4.4	24.3	22.9	16.2	0.16
960408	2200	1.07	0.093	0.093	10.72	10.72	14.0	12.0	1.2	31.1	23.7	15.4	0.16
960409	0100	1.10	0.093	0.093	10.72	10.72	10.0	10.0	16.1	29.3	36.7	15.2	0.12
960409	0400	1.49	0.093	0.093	10.72	10.72	10.0	12.0	20.7	27.6	23.2	15.2	0.08

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	x
960409	0700	1.43	0.083	0.083	11.98	11.98	10.0	8.0	6.4	30.9	29.8	19.6	0.09
960409	1000	1.51	0.093	0.093	10.72	10.72	8.0	8.0	-7.6	50.8	30.9	15.1	0.11
960409	1300	1.38	0.123	0.093	8.16	10.72	-40.0	8.0	2.6	37.1	29.6	15.5	0.10
960409	1600	1.20	0.142	0.132	7.04	7.56	10.0	10.0	11.5	26.5	24.2	44.6	0.10
960409	1900	1.11	0.083	0.123	11.98	8.16	6.0	6.0	17.0	37.9	21.5	40.3	0.12
960409	2200	1.09	0.181	0.113	5.52	8.87	40.0	44.0	22.4	34.5	18.1	27.4	0.13
960410	0100	1.13	0.171	0.152	5.83	6.59	40.0	42.0	24.9	28.3	16.0	12.8	0.13
960410	0400	1.10	0.142	0.123	7.04	8.16	24.0	24.0	23.7	21.5	14.9	16.2	0.10
960410	0700	1.06	0.123	0.123	8.16	8.16	12.0	22.0	23.4	21.7	14.6	14.2	0.10
960410	1000	1.06	0.132	0.132	7.56	7.56	18.0	18.0	24.9	22.4	16.6	15.1	0.11
960410	1300	0.88	0.113	0.113	8.87	8.87	18.0	20.0	23.9	22.3	14.9	13.6	0.13
960410	1600	0.74	0.162	0.113	6.19	8.87	30.0	28.0	24.7	24.5	15.9	17.3	0.11
960410	1900	0.65	0.103	0.113	9.71	8.87	8.0	12.0	20.6	24.3	16.8	16.4	0.10
960410	2200	0.51	0.113	0.113	8.87	8.87	14.0	30.0	19.9	29.4	19.0	18.5	0.17
960411	0100	0.41	0.162	0.113	6.19	8.87	32.0	32.0	24.1	37.1	35.2	21.7	0.18
960411	0400	0.31	0.074	0.074	13.56	13.56	-12.0	32.0	15.7	40.0	28.4	13.9	0.17
960411	0700	0.26	0.074	0.074	13.56	13.56	-10.0	28.0	13.5	38.6	33.4	16.6	0.13
960411	1000	0.24	0.074	0.083	13.56	11.98	-8.0	-6.0	10.3	44.6	41.6	22.5	0.21
960411	1300	0.25	0.074	0.083	13.56	11.98	-12.0	-10.0	-8.5	52.1	44.8	19.7	0.19
960411	1600	0.26	0.162	0.162	6.19	6.19	-46.0	-48.0	-28.7	57.3	45.6	61.3	0.14
960411	1900	0.25	0.191	0.181	5.24	5.52	-48.0	-50.0	-27.8	55.0	45.5	64.5	0.12
960411	2200	0.21	0.269	0.083	3.72	11.98	-54.0	-52.0	-20.9	54.8	33.9	34.3	0.20
960412	0100	0.21	0.250	0.083	4.01	11.98	-48.0	-48.0	-34.7	41.8	26.3	29.1	0.23
960412	0400	0.20	0.230	0.083	4.35	11.98	-44.0	-44.0	-34.1	35.4	27.2	29.0	0.19
960412	0700	0.18	0.083	0.083	11.98	11.98	6.0	-38.0	-30.5	35.5	25.8	25.0	0.16
960412	1000	0.21	0.132	0.083	7.56	11.98	-40.0	-42.0	-34.5	38.0	26.9	24.7	0.18
960412	1300	0.21	0.152	0.083	6.59	11.98	-50.0	-50.0	-38.6	35.6	29.7	26.6	0.25
960412	1600	0.25	0.279	0.083	3.59	11.98	-66.0	-50.0	-46.0	41.1	30.7	32.2	0.20
960412	1900	0.24	0.308	0.269	3.25	3.72	-64.0	-62.0	-47.4	36.0	19.0	11.3	0.19
960412	2200	0.25	0.289	0.259	3.47	3.86	-66.0	-64.0	-48.0	33.0	13.8	6.7	0.20
960413	0100	0.24	0.132	0.123	7.56	8.16	-42.0	-66.0	-44.8	34.4	18.1	10.8	0.30
960413	0400	0.24	0.132	0.132	7.56	7.56	-44.0	-44.0	-41.0	26.7	21.4	6.4	0.25
960413	0700	0.28	0.123	0.123	8.16	8.16	-40.0	-40.0	-36.0	16.6	17.4	4.7	0.24
960413	1000	0.25	0.132	0.132	7.56	7.56	-42.0	-42.0	-33.7	34.5	22.2	6.2	0.22
960413	1300	0.27	0.132	0.132	7.56	7.56	-44.0	-44.0	-43.8	39.6	28.3	7.5	0.26
960413	1600	0.38	0.132	0.220	7.56	4.54	-46.0	-48.0	-57.1	31.4	24.7	15.6	0.22
960413	1900	0.29	0.103	0.074	9.71	13.56	-32.0	-90.0	-54.9	38.3	25.8	26.7	0.26
960413	2200	0.31	0.132	0.132	7.56	7.56	-44.0	-44.0	-34.1	43.8	32.3	7.8	0.20
960414	0100	0.35	0.132	0.132	7.56	7.56	-44.0	-44.0	-27.2	56.8	47.5	15.6	0.25
960414	0400	0.37	0.132	0.142	7.56	7.04	-44.0	-44.0	-24.0	60.4	53.0	53.2	0.25
960414	0700	0.36	0.132	0.132	7.56	7.56	-44.0	-44.0	-31.7	53.3	49.6	8.1	0.20
960414	1000	0.40	0.142	0.162	7.04	6.19	-46.0	-46.0	-27.4	57.1	50.4	67.4	0.15
960414	1300	0.45	0.132	0.162	7.56	6.19	-44.0	-44.0	-38.6	61.4	52.3	65.5	0.17
960414	1600	0.45	0.132	0.103	7.56	9.71	-44.0	-42.0	-29.5	64.2	47.4	20.9	0.19
960414	1900	0.39	0.103	0.103	9.71	9.71	-36.0	-40.0	-13.8	58.1	43.7	20.2	0.20
960414	2200	0.37	0.113	0.103	8.87	9.71	-36.0	-38.0	-10.3	54.8	43.7	27.6	0.15
960415	0100	0.45	0.113	0.152	8.87	6.59	-40.0	-40.0	-5.0	57.9	40.3	50.9	0.16
960415	0400	0.57	0.201	0.171	4.98	5.83	18.0	22.0	2.4	57.8	44.1	64.4	0.14
960415	0700	0.84	0.269	0.279	3.72	3.59	-16.0	-12.0	-5.0	48.2	41.9	40.7	0.11
960415	1000	1.00	0.230	0.230	4.35	4.35	-32.0	-36.0	-12.4	45.8	42.5	29.3	0.08
960415	1300	0.87	0.210	0.210	4.75	4.75	-36.0	-34.0	-1.9	59.0	53.8	65.1	0.10
960415	1600	0.91	0.289	0.220	3.47	4.54	-62.0	-60.0	-23.7	63.7	41.3	49.8	0.12
960415	1900	0.93	0.181	0.201	5.52	4.98	-46.0	-46.0	-42.3	53.4	50.0	59.1	0.11
960415	2200	1.09	0.152	0.142	6.59	7.04	-40.0	-42.0	-42.2	36.4	39.0	37.3	0.09

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
960416	0100	1.22	0.132	0.132	7.56	7.56	-40.0	-40.0	-42.5	25.5	24.5	25.0	0.12
960416	0400	1.11	0.132	0.132	7.56	7.56	-42.0	-40.0	-42.1	29.0	28.2	28.2	0.12
960416	0700	0.93	0.132	0.123	7.56	8.16	-44.0	-42.0	-40.9	30.9	30.8	30.5	0.12
960416	1000	0.82	0.123	0.123	8.16	8.16	-40.0	-40.0	-39.3	34.3	34.1	26.9	0.11
960416	1300	0.79	0.113	0.113	8.87	8.87	-38.0	-40.0	-38.3	37.3	36.2	32.2	0.11
960416	1600	0.72	0.123	0.113	8.16	8.87	-40.0	-40.0	-26.4	45.2	43.3	38.3	0.16
960416	1900	0.66	0.132	0.113	7.56	8.87	-40.0	4.0	-13.6	45.4	40.6	35.9	0.18
960416	2200	0.63	0.308	0.103	3.25	9.71	56.0	56.0	6.6	66.1	31.2	31.3	0.13
960417	0100	0.57	0.308	0.113	3.25	8.87	56.0	4.0	10.1	52.4	31.2	39.7	0.12
960417	0400	0.57	0.093	0.093	10.72	10.72	8.0	6.0	8.2	40.5	27.1	18.2	0.26
960417	0700	0.57	0.318	0.083	3.15	11.98	54.0	8.0	13.8	42.9	25.1	18.6	0.25
960417	1000	0.62	0.083	0.083	11.98	11.98	8.0	56.0	18.6	55.2	20.8	17.2	0.15
960417	1600	0.49	0.083	0.083	11.98	11.98	10.0	8.0	2.8	28.4	28.1	19.4	0.23
960417	1900	0.48	0.083	0.083	11.98	11.98	10.0	8.0	-0.4	28.8	30.1	20.7	0.37
960417	2200	0.49	0.083	0.083	11.98	11.98	10.0	8.0	0.1	33.5	30.8	25.9	0.26
960418	0100	0.54	0.083	0.083	11.98	11.98	10.0	8.0	0.6	26.8	25.1	22.0	0.11
960418	0400	0.54	0.083	0.083	11.98	11.98	6.0	4.0	0.5	23.1	24.2	18.2	0.25
960418	0700	0.55	0.083	0.083	11.98	11.98	10.0	8.0	3.4	25.8	25.2	19.1	0.34
960418	1000	0.53	0.083	0.083	11.98	11.98	8.0	6.0	1.9	25.8	24.9	19.7	0.19
960418	1300	0.61	0.083	0.083	11.98	11.98	8.0	6.0	2.3	24.1	23.7	20.7	0.12
960418	1600	0.64	0.083	0.083	11.98	11.98	8.0	6.0	-0.4	26.8	24.3	17.9	0.29
960418	1900	0.65	0.083	0.083	11.98	11.98	6.0	6.0	-1.4	29.3	26.4	22.5	0.30
960418	2200	0.61	0.083	0.083	11.98	11.98	8.0	6.0	-0.9	25.9	24.9	22.3	0.26
960419	0100	0.59	0.083	0.083	11.98	11.98	6.0	6.0	-0.2	25.6	25.0	26.5	0.13
960419	0400	0.59	0.083	0.083	11.98	11.98	4.0	2.0	-1.4	23.7	23.4	19.3	0.19
960419	0700	0.55	0.083	0.083	11.98	11.98	6.0	6.0	-1.2	24.9	23.1	19.7	0.28
960419	1000	0.54	0.093	0.093	10.72	10.72	4.0	4.0	-2.7	24.1	23.5	18.3	0.26
960419	1300	0.52	0.093	0.093	10.72	10.72	8.0	4.0	-4.6	30.6	23.7	22.6	0.15
960419	1600	0.54	0.093	0.093	10.72	10.72	6.0	4.0	-13.5	44.1	19.4	21.4	0.22
960419	1900	0.49	0.074	0.093	13.56	10.72	-10.0	-60.0	-12.8	44.8	23.0	30.8	0.38
960419	2200	0.46	0.074	0.093	13.56	10.72	-8.0	-6.0	-7.9	29.9	23.3	24.3	0.36
960420	0100	0.43	0.074	0.093	13.56	10.72	-10.0	-6.0	-10.6	33.5	23.1	29.4	0.19
960420	0400	0.47	0.074	0.093	13.56	10.72	-12.0	4.0	-13.4	37.5	22.5	23.6	0.18
960420	0700	0.52	0.074	0.103	13.56	9.71	-8.0	-50.0	-19.9	44.5	20.5	21.2	0.26
960420	1000	0.50	0.074	0.093	13.56	10.72	-14.0	-48.0	-22.0	43.9	21.0	22.7	0.26
960420	1300	0.55	0.279	0.074	3.59	13.56	-56.0	-54.0	-30.7	44.9	17.7	21.7	0.14
960420	1600	0.61	0.308	0.074	3.25	13.56	-58.0	-58.0	-35.8	41.8	15.5	21.8	0.18
960420	1900	0.59	0.162	0.074	6.19	13.56	-44.0	-54.0	-30.4	37.3	17.7	22.2	0.26
960420	2200	0.54	0.142	0.142	7.04	7.04	-42.0	-44.0	-31.3	36.7	19.2	13.5	0.28
960421	0100	0.49	0.171	0.074	5.83	13.56	-48.0	-48.0	-30.4	39.7	20.8	22.4	0.15
960421	0400	0.50	0.074	0.074	13.56	13.56	-8.0	-46.0	-29.1	41.0	18.1	17.0	0.13
960421	0700	0.49	0.162	0.074	6.19	13.56	-46.0	-46.0	-30.7	41.2	19.6	18.1	0.19
960421	1000	0.46	0.171	0.074	5.83	13.56	-50.0	-50.0	-33.1	43.1	20.9	21.4	0.22
960421	1300	0.48	0.171	0.074	5.83	13.56	-50.0	-50.0	-35.5	42.7	21.5	20.7	0.13
960421	1600	0.47	0.171	0.074	5.83	13.56	-48.0	-48.0	-32.1	43.8	20.2	21.6	0.18
960421	1900	0.45	0.171	0.074	5.83	13.56	-48.0	-50.0	-30.7	46.9	18.8	19.7	0.31
960421	2200	0.44	0.162	0.074	6.19	13.56	-48.0	-50.0	-33.3	48.1	17.6	20.3	0.31
960422	0100	0.41	0.171	0.074	5.83	13.56	-50.0	-50.0	-31.0	47.4	19.8	20.7	0.25
960422	0400	0.42	0.181	0.083	5.52	11.98	-52.0	-46.0	-33.5	44.3	20.4	23.3	0.18
960422	0700	0.42	0.171	0.083	5.83	11.98	-50.0	-58.0	-35.2	49.2	25.7	26.2	0.20
960422	1000	0.42	0.181	0.074	5.52	13.56	-58.0	-60.0	-38.8	49.2	24.8	20.7	0.25
960422	1300	0.41	0.074	0.083	13.56	11.98	-6.0	-58.0	-35.9	50.7	23.9	25.7	0.33
960422	1600	0.47	0.250	0.083	4.01	11.98	-90.0	-90.0	-54.9	58.2	26.5	25.2	0.30
960422	1900	0.49	0.259	0.083	3.86	11.98	-90.0	-90.0	-58.6	59.3	22.8	22.7	0.28

(Sheet 34 of 54)

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
960422	2200	0.41	0.074	0.083	13.56	11.98	-20.0	-62.0	-42.8	49.7	19.3	27.1	0.24
960423	0100	0.34	0.074	0.083	13.56	11.98	-20.0	-44.0	-29.8	42.5	19.6	19.1	0.40
960423	0400	0.34	0.142	0.083	7.04	11.98	-44.0	-44.0	-28.2	38.9	21.5	23.1	0.24
960423	0700	0.38	0.152	0.083	6.59	11.98	-42.0	-46.0	-33.5	36.7	19.2	24.6	0.27
960423	1000	0.46	0.162	0.181	6.19	5.52	-46.0	-50.0	-39.5	32.1	16.4	10.8	0.20
960423	1300	0.55	0.240	0.152	4.17	6.59	-54.0	-54.0	-45.4	19.8	12.4	11.1	0.19
960423	1600	0.65	0.318	0.318	3.15	3.15	-58.0	-56.0	-48.6	16.4	9.4	5.8	0.22
960423	1900	0.60	0.318	0.318	3.15	3.15	-56.0	-56.0	-47.6	15.2	8.6	6.0	0.28
960423	2200	0.48	0.250	0.250	4.01	4.01	-58.0	-56.0	-45.7	20.1	10.1	4.4	0.25
960424	0100	0.41	0.142	0.132	7.04	7.56	-40.0	-56.0	-36.8	41.1	26.2	17.4	0.25
960424	0400	0.87	0.210	0.230	4.75	4.35	48.0	48.0	44.4	22.0	17.2	11.4	0.18
960424	0700	1.33	0.171	0.171	5.83	5.83	40.0	40.0	43.2	19.8	16.4	8.8	0.13
960424	1000	1.18	0.171	0.162	5.83	6.19	36.0	36.0	40.8	19.7	17.4	9.7	0.16
960424	1300	0.84	0.171	0.171	5.83	5.83	38.0	36.0	39.3	22.3	18.8	9.3	0.15
960424	1600	0.69	0.162	0.181	6.19	5.52	34.0	32.0	38.1	29.7	19.0	13.4	0.10
960424	1900	0.52	0.162	0.162	6.19	6.19	34.0	34.0	32.1	40.5	27.6	10.5	0.12
960424	2200	0.41	0.162	0.171	6.19	5.83	32.0	34.0	23.3	51.1	33.2	10.9	0.18
960425	0100	0.34	0.142	0.132	7.04	7.56	-42.0	-40.0	-2.9	67.9	32.3	20.3	0.24
960425	0400	0.31	0.142	0.132	7.04	7.56	-38.0	-38.0	-19.7	45.0	36.6	25.2	0.28
960425	0700	0.31	0.132	0.083	7.56	11.98	-40.0	-40.0	-29.6	37.3	33.5	26.0	0.22
960425	1000	0.31	0.132	0.132	7.56	7.56	-38.0	-38.0	-29.8	33.6	32.0	21.3	0.22
960425	1300	0.44	0.298	0.298	3.35	3.35	-58.0	-60.0	-45.0	30.9	16.1	7.8	0.26
960425	1600	0.57	0.289	0.289	3.47	3.47	-60.0	-58.0	-51.0	16.1	10.7	6.7	0.24
960425	1900	0.58	0.269	0.269	3.72	3.72	-56.0	-56.0	-49.1	16.1	10.4	6.2	0.25
960425	2200	0.52	0.318	0.318	3.15	3.15	-56.0	-54.0	-46.3	17.9	12.6	7.1	0.25
960426	0100	0.60	0.171	0.152	5.83	6.59	-46.0	-52.0	-44.7	21.3	14.9	16.8	0.17
960426	0400	0.55	0.162	0.152	6.19	6.59	-48.0	-50.0	-43.7	23.8	18.3	22.4	0.18
960426	0700	0.59	0.152	0.152	6.59	6.59	-44.0	-48.0	-44.1	23.4	14.6	14.5	0.15
960426	1000	0.72	0.171	0.152	5.83	6.59	-44.0	-52.0	-46.2	20.1	12.0	18.0	0.16
960426	1300	0.67	0.152	0.132	6.59	7.56	-42.0	-52.0	-46.1	22.5	15.1	15.6	0.15
960426	1600	0.58	0.152	0.142	6.59	7.04	-46.0	-46.0	-23.5	33.9	34.8	18.0	0.15
960426	1900	0.50	0.152	0.142	6.59	7.04	-44.0	-44.0	-40.7	26.0	23.5	21.6	0.19
960426	2200	0.48	0.152	0.142	6.59	7.04	-44.0	-44.0	-41.5	31.6	20.5	23.8	0.22
960427	0100	0.46	0.152	0.152	6.59	6.59	-44.0	-44.0	-39.7	32.8	20.0	12.1	0.22
960427	0400	0.45	0.132	0.064	7.56	15.63	-38.0	-40.0	-32.6	35.0	21.8	16.6	0.31
960427	0700	0.49	0.064	0.074	15.63	13.56	-2.0	-40.0	-30.8	37.5	24.1	15.9	0.27
960427	1000	0.59	0.074	0.074	13.56	13.56	0.0	-38.0	-23.8	37.4	22.7	13.2	0.26
960427	1300	0.60	0.074	0.074	13.56	13.56	-6.0	8.0	-15.5	38.2	22.0	16.6	0.25
960427	1600	0.60	0.074	0.074	13.56	13.56	4.0	-6.0	-9.3	34.1	23.0	16.9	0.21
960427	1900	0.67	0.074	0.074	13.56	13.56	-10.0	-10.0	-4.3	31.0	24.4	15.8	0.19
960427	2200	0.65	0.074	0.074	13.56	13.56	-8.0	-8.0	-4.7	30.9	27.0	18.7	0.17
960428	0100	0.64	0.074	0.074	13.56	13.56	-10.0	4.0	-9.8	33.3	28.7	19.3	0.15
960428	0400	0.61	0.074	0.074	13.56	13.56	-6.0	-4.0	-2.4	37.6	28.6	22.0	0.16
960428	0700	0.64	0.074	0.083	13.56	11.98	-4.0	-2.0	-5.5	34.4	31.2	21.7	0.21
960428	1000	0.71	0.083	0.083	11.98	11.98	6.0	4.0	-17.5	42.9	30.0	19.7	0.19
960428	1300	0.68	0.083	0.083	11.98	11.98	8.0	-46.0	-19.0	46.9	27.1	23.3	0.17
960428	1600	0.66	0.083	0.083	11.98	11.98	8.0	-20.0	-23.0	42.3	29.3	29.0	0.18
960428	1900	0.61	0.083	0.083	11.98	11.98	8.0	-16.0	-18.6	36.7	28.3	26.5	0.24
960428	2200	0.61	0.083	0.083	11.98	11.98	2.0	2.0	-20.0	40.2	27.5	21.6	0.18
960429	0100	0.64	0.083	0.083	11.98	11.98	4.0	-50.0	-27.7	46.8	26.1	21.5	0.14
960429	0400	0.70	0.181	0.181	5.52	5.52	-50.0	-50.0	-33.9	38.5	22.6	13.6	0.13
960429	0700	0.73	0.162	0.162	6.19	6.19	-48.0	-48.0	-34.8	32.9	24.2	23.8	0.11
960429	1000	0.74	0.181	0.152	5.52	6.59	-46.0	-46.0	-37.5	28.5	23.0	19.2	0.12

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Appendix A Table of Collection Times and Bulk Parameters

A35

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
960429	1300	0.81	0.162	0.162	6.19	6.19	-44.0	-46.0	-41.2	27.9	23.0	18.8	0.14
960429	1600	0.86	0.162	0.162	6.19	6.19	-46.0	-46.0	-43.4	23.6	18.8	18.7	0.15
960429	1900	0.78	0.162	0.152	6.19	6.59	-46.0	-46.0	-41.5	26.4	20.8	22.3	0.13
960429	2200	0.74	0.162	0.152	6.19	6.59	-44.0	-46.0	-41.0	27.2	21.3	24.5	0.12
960430	0100	0.80	0.162	0.162	6.19	6.19	-46.0	-46.0	-41.7	25.3	19.4	17.9	0.15
960430	0400	0.85	0.152	0.152	6.59	6.59	-44.0	-46.0	-43.1	21.2	16.1	18.9	0.16
960430	0700	0.91	0.152	0.142	6.59	7.04	-44.0	-44.0	-45.2	20.6	14.7	16.7	0.15
960430	1000	1.05	0.230	0.142	4.35	7.04	-52.0	-56.0	-47.6	19.5	12.0	17.0	0.21
960430	1300	0.98	0.132	0.142	7.56	7.04	-40.0	-56.0	-46.6	21.2	12.9	14.7	0.19
960430	1600	0.80	0.142	0.132	7.04	7.56	-44.0	-44.0	-43.4	23.2	17.1	18.7	0.17
960430	1900	0.70	0.123	0.123	8.16	8.16	-38.0	-42.0	-40.2	24.1	22.2	16.7	0.17
960430	2200	0.64	0.142	0.123	7.04	8.16	-42.0	-40.0	-38.8	29.1	26.5	25.3	0.13
960501	0100	0.63	0.123	0.123	8.16	8.16	-40.0	-40.0	-26.0	33.6	29.7	25.6	0.14
960501	0400	0.74	0.132	0.123	7.56	8.16	-34.0	-36.0	8.4	79.5	27.0	27.3	0.18
960501	0700	0.66	0.123	0.123	8.16	8.16	-34.0	-36.0	-2.8	53.3	30.3	20.2	0.16
960501	1000	0.66	0.132	0.123	7.56	8.16	-34.0	-36.0	-0.2	58.9	31.3	22.5	0.12
960501	1600	0.67	0.123	0.123	8.16	8.16	-36.0	-38.0	-19.7	42.8	29.9	19.0	0.19
960501	1900	0.58	0.132	0.123	7.56	8.16	-38.0	-38.0	-21.1	40.6	30.2	17.6	0.16
960501	2200	0.55	0.123	0.123	8.16	8.16	-36.0	-38.0	-20.4	36.9	32.5	19.5	0.14
960502	0100	0.58	0.142	0.132	7.04	7.56	-38.0	-38.0	-23.7	34.8	34.6	26.7	0.13
960502	0400	0.64	0.123	0.123	8.16	8.16	-38.0	-38.0	-24.4	32.1	30.9	26.7	0.17
960502	0700	0.58	0.123	0.132	8.16	7.56	-36.0	-38.0	-27.5	35.0	31.4	31.2	0.17
960502	1300	0.49	0.132	0.132	7.56	7.56	-40.0	-38.0	-20.6	39.0	33.5	34.8	0.16
960502	1600	0.50	0.152	0.142	6.59	7.04	-42.0	-40.0	-18.4	41.2	35.4	30.7	0.20
960502	1900	0.49	0.132	0.093	7.56	10.72	-38.0	-40.0	-23.1	39.3	34.8	25.4	0.21
960502	2200	0.50	0.152	0.132	6.59	7.56	-40.0	-38.0	-20.4	37.1	31.3	33.8	0.18
960503	0100	0.55	0.123	0.103	8.16	9.71	-36.0	-36.0	-21.3	35.0	29.9	23.2	0.15
960503	0400	0.56	0.123	0.123	8.16	8.16	-36.0	-38.0	-24.3	37.5	32.2	29.6	0.21
960503	0700	0.51	0.123	0.123	8.16	8.16	-38.0	-38.0	-25.8	39.7	33.2	31.1	0.23
960503	1000	0.52	0.123	0.083	8.16	11.98	-34.0	-38.0	-23.3	38.8	27.3	23.8	0.22
960503	1300	0.57	0.318	0.083	3.15	11.98	-60.0	-60.0	-26.1	46.0	22.9	20.2	0.16
960503	1600	0.64	0.308	0.083	3.25	11.98	-58.0	-56.0	-28.9	50.0	20.6	27.5	0.28
960503	1900	0.60	0.142	0.083	7.04	11.98	-40.0	-56.0	-22.3	46.5	22.7	24.8	0.24
960503	2200	0.65	0.074	0.074	13.56	13.56	-2.0	6.0	-16.9	44.0	23.2	20.7	0.21
960504	0100	0.71	0.083	0.083	11.98	11.98	10.0	8.0	-12.0	34.9	21.7	20.8	0.11
960504	0400	0.80	0.083	0.083	11.98	11.98	8.0	8.0	-9.3	31.2	22.7	19.5	0.22
960504	0700	0.75	0.083	0.083	11.98	11.98	12.0	6.0	-6.5	34.4	24.0	23.9	0.24
960504	1000	0.74	0.083	0.083	11.98	11.98	10.0	0.0	-4.1	31.9	25.5	26.6	0.17
960504	1300	0.76	0.083	0.083	11.98	11.98	8.0	8.0	-9.4	34.3	22.6	22.9	0.10
960504	1600	0.87	0.083	0.083	11.98	11.98	10.0	-58.0	-17.4	50.4	20.0	24.8	0.22
960504	1900	0.83	0.074	0.083	13.56	11.98	-8.0	-8.0	-13.9	39.3	21.5	23.6	0.21
960504	2200	0.80	0.074	0.074	13.56	13.56	-14.0	6.0	-9.6	28.5	22.6	20.1	0.21
960505	0100	0.71	0.074	0.083	13.56	11.98	2.0	4.0	-4.6	28.6	25.1	23.2	0.11
960505	0400	0.71	0.074	0.083	13.56	11.98	-12.0	8.0	-8.0	31.2	24.2	22.7	0.15
960505	0700	0.77	0.083	0.083	11.98	11.98	6.0	6.0	-4.2	29.2	26.9	22.6	0.19
960505	1000	0.69	0.083	0.083	11.98	11.98	10.0	8.0	-4.8	30.4	29.5	25.6	0.20
960505	1300	0.79	0.083	0.083	11.98	11.98	6.0	6.0	4.6	30.3	25.9	20.4	0.13
960505	1600	0.82	0.083	0.083	11.98	11.98	8.0	8.0	4.2	30.6	29.1	25.0	0.18
960505	1900	0.79	0.083	0.083	11.98	11.98	4.0	4.0	7.2	41.4	38.8	22.8	0.19
960505	2200	0.81	0.083	0.083	11.98	11.98	8.0	6.0	2.8	39.1	34.5	28.7	0.17
960506	0100	0.69	0.083	0.083	11.98	11.98	8.0	6.0	2.5	35.7	32.1	25.4	0.13
960506	0400	0.64	0.093	0.083	10.72	11.98	6.0	6.0	0.3	31.4	29.4	25.0	0.16
960506	0700	0.56	0.083	0.083	11.98	11.98	6.0	6.0	-2.5	33.1	31.5	25.2	0.26

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
960506	1000	0.53	0.093	0.093	10.72	10.72	8.0	8.0	-4.8	34.8	32.6	24.7	0.24
960506	1300	0.64	0.093	0.093	10.72	10.72	8.0	8.0	9.9	48.2	33.9	25.7	0.14
960506	1600	0.54	0.093	0.093	10.72	10.72	6.0	4.0	-2.8	43.2	37.2	28.4	0.18
960506	1900	0.69	0.093	0.093	10.72	10.72	-22.0	14.0	3.2	38.9	33.7	36.1	0.18
960506	2200	1.09	0.240	0.220	4.17	4.54	12.0	14.0	14.0	32.1	30.8	29.7	0.18
960507	0100	1.29	0.191	0.191	5.24	5.24	26.0	28.0	22.8	30.9	30.7	24.5	0.09
960507	0400	1.40	0.191	0.181	5.24	5.52	30.0	10.0	16.8	29.1	28.4	23.6	0.08
960507	0700	1.49	0.181	0.181	5.52	5.52	8.0	8.0	15.0	29.0	28.5	24.4	0.09
960507	1000	1.55	0.152	0.152	6.59	6.59	12.0	12.0	19.2	30.2	28.8	20.0	0.10
960507	1300	1.56	0.123	0.132	8.16	7.56	12.0	10.0	12.8	27.5	27.1	20.2	0.08
960507	1600	1.50	0.123	0.123	8.16	8.16	6.0	8.0	13.4	28.5	29.5	17.9	0.07
960507	1900	1.36	0.123	0.123	8.16	8.16	8.0	8.0	9.6	30.0	32.8	16.6	0.09
960507	2200	1.21	0.123	0.123	8.16	8.16	10.0	10.0	8.6	30.8	34.1	17.0	0.11
960508	0100	1.13	0.123	0.123	8.16	8.16	8.0	6.0	8.3	30.6	35.4	17.6	0.09
960508	0400	1.07	0.132	0.132	7.56	7.56	8.0	6.0	5.8	30.8	32.9	18.7	0.08
960508	0700	1.13	0.152	0.152	6.59	6.59	4.0	2.0	5.4	25.8	27.8	25.0	0.09
960508	1000	1.05	0.093	0.142	10.72	7.04	-2.0	2.0	-2.5	27.0	29.0	24.1	0.13
960508	1300	0.96	0.123	0.093	8.16	10.72	0.0	-2.0	-3.2	27.5	29.8	19.3	0.12
960508	1600	0.88	0.103	0.103	9.71	9.71	0.0	-2.0	-8.8	28.4	32.2	17.3	0.09
960508	1900	0.86	0.113	0.162	8.87	6.19	0.0	0.0	-14.0	31.9	36.0	38.6	0.12
960508	2200	0.82	0.083	0.083	11.98	11.98	-10.0	-10.0	-19.0	31.6	37.7	15.9	0.21
960509	0100	0.74	0.083	0.083	11.98	11.98	2.0	0.0	-0.8	33.0	36.0	17.4	0.20
960509	0400	0.72	0.093	0.093	10.72	10.72	0.0	2.0	-1.9	32.1	35.0	18.9	0.10
960509	0700	0.75	0.093	0.093	10.72	10.72	4.0	2.0	-1.0	31.7	33.4	18.0	0.10
960509	1000	0.66	0.093	0.093	10.72	10.72	8.0	2.0	4.2	39.3	41.2	23.4	0.18
960509	1300	0.62	0.103	0.103	9.71	9.71	2.0	-2.0	15.0	41.9	40.7	18.4	0.18
960509	1600	0.81	0.279	0.279	3.59	3.59	42.0	40.0	27.0	37.6	23.9	15.7	0.12
960509	1900	0.80	0.162	0.230	6.19	4.35	16.0	14.0	23.3	34.7	22.2	20.4	0.11
960509	2200	0.80	0.220	0.220	4.54	4.54	32.0	18.0	24.3	32.6	23.0	17.4	0.16
960510	0100	0.73	0.220	0.220	4.54	4.54	36.0	14.0	24.0	36.4	25.6	19.6	0.18
960510	0400	0.66	0.074	0.132	13.56	7.56	-14.0	8.0	18.7	37.0	26.2	28.9	0.13
960510	0700	0.73	0.132	0.152	7.56	6.59	6.0	6.0	13.2	29.1	24.4	18.2	0.10
960510	1000	0.85	0.132	0.132	7.56	7.56	10.0	10.0	12.3	23.1	22.6	16.5	0.13
960510	1300	0.94	0.142	0.142	7.04	7.04	8.0	8.0	10.3	20.0	20.5	11.9	0.15
960510	1600	0.91	0.113	0.103	8.87	9.71	2.0	4.0	6.1	20.7	20.2	16.1	0.12
960510	1900	0.81	0.113	0.103	8.87	9.71	0.0	2.0	2.1	22.6	22.4	18.0	0.09
960510	2200	0.77	0.103	0.103	9.71	9.71	2.0	4.0	-0.4	24.9	24.8	16.6	0.14
960511	0100	0.75	0.103	0.103	9.71	9.71	0.0	2.0	-1.5	23.6	23.8	16.4	0.20
960511	0400	0.69	0.093	0.093	10.72	10.72	2.0	0.0	-3.2	23.2	23.9	19.7	0.16
960511	0700	0.68	0.103	0.103	9.71	9.71	0.0	0.0	-4.9	24.3	24.5	19.4	0.08
960511	1000	0.66	0.103	0.103	9.71	9.71	0.0	0.0	-5.3	26.1	22.7	17.0	0.13
960511	1300	0.67	0.093	0.093	10.72	10.72	0.0	0.0	-13.7	41.3	22.3	16.5	0.25
960511	1600	0.62	0.210	0.093	4.75	10.72	-50.0	-52.0	-23.5	48.1	19.3	20.1	0.20
960511	1900	0.49	0.113	0.113	8.87	8.87	-2.0	-2.0	-16.4	38.9	22.1	23.2	0.10
960511	2200	0.43	0.103	0.103	9.71	9.71	4.0	-2.0	-15.8	37.0	28.8	30.0	0.13
960512	0100	0.41	0.132	0.113	7.56	8.87	-40.0	-6.0	-23.9	39.3	28.6	29.1	0.26
960512	0400	0.39	0.113	0.123	8.87	8.16	-38.0	-4.0	-7.9	40.1	29.7	29.9	0.22
960512	0700	0.40	0.318	0.113	3.15	8.87	60.0	-6.0	7.2	68.5	27.8	30.8	0.11
960512	1000	0.65	0.210	0.210	4.75	4.75	50.0	50.0	31.5	37.8	19.1	10.6	0.11
960512	1300	0.63	0.181	0.201	5.52	4.98	38.0	52.0	29.4	57.5	23.3	20.2	0.24
960512	1600	0.60	0.123	0.201	8.16	4.98	-38.0	46.0	33.4	74.5	35.2	30.5	0.22
960512	1900	0.49	0.123	0.230	8.16	4.35	-40.0	-40.0	32.1	76.0	27.9	17.1	0.13
960512	2200	0.50	0.123	0.240	8.16	4.17	-40.0	54.0	24.4	66.6	20.6	15.1	0.11

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Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{JDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
960513	0100	0.59	0.259	0.259	3.86	3.86	52.0	52.0	31.7	33.7	16.7	9.8	0.17
960513	0400	0.80	0.210	0.220	4.75	4.54	50.0	50.0	39.9	22.6	18.1	13.9	0.22
960513	0700	0.73	0.210	0.201	4.75	4.98	40.0	38.0	26.2	20.3	15.3	11.6	0.16
960513	1000	0.76	0.181	0.191	5.52	5.24	40.0	38.0	25.1	22.7	18.7	15.7	0.15
960513	1300	0.68	0.191	0.181	5.24	5.52	42.0	38.0	21.5	29.8	20.5	17.6	0.21
960513	1600	0.57	0.191	0.191	5.24	5.24	40.0	40.0	17.5	46.9	21.5	13.2	0.20
960513	1900	0.48	0.123	0.123	8.16	8.16	-40.0	40.0	10.9	60.3	23.6	23.2	0.12
960513	2200	0.58	0.123	0.298	8.16	3.35	-36.0	-36.0	-4.7	45.2	34.6	28.6	0.10
960514	0100	0.75	0.259	0.259	3.86	3.86	-4.0	-8.0	-13.0	41.0	34.2	25.6	0.12
960514	0400	0.75	0.230	0.259	4.35	3.86	-40.0	-40.0	-21.4	46.3	35.0	39.1	0.15
960514	0700	0.61	0.113	0.269	8.87	3.72	-36.0	-36.0	-15.2	48.2	34.1	45.2	0.11
960514	1000	0.53	0.123	0.259	8.16	3.86	-38.0	-36.0	-17.2	40.3	28.7	27.7	0.09
960514	1300	0.52	0.113	0.113	8.87	8.87	-34.0	-34.0	-17.1	34.4	27.6	23.4	0.14
960514	1600	0.51	0.113	0.113	8.87	8.87	-30.0	-18.0	-19.3	31.3	25.0	16.8	0.23
960514	1900	0.58	0.279	0.269	3.59	3.72	-4.0	-10.0	-17.3	29.9	25.0	22.5	0.16
960514	2200	0.69	0.250	0.240	4.01	4.17	-26.0	-14.0	-20.7	29.5	27.7	26.1	0.10
960515	0100	0.59	0.123	0.142	8.16	7.04	-36.0	-34.0	-20.6	26.3	24.9	17.2	0.11
960515	0400	0.70	0.269	0.279	3.72	3.59	-32.0	-14.0	-24.6	26.4	25.5	29.7	0.16
960515	0700	0.78	0.240	0.240	4.17	4.17	-32.0	-12.0	-25.7	27.9	27.0	22.6	0.11
960515	1000	0.94	0.220	0.220	4.54	4.54	-18.0	-14.0	-25.1	30.2	28.6	23.3	0.08
960515	1300	1.01	0.201	0.210	4.98	4.75	-34.0	-34.0	-19.9	30.3	28.8	28.5	0.08
960515	1600	0.98	0.201	0.201	4.98	4.98	-16.0	-16.0	-21.6	28.1	28.3	17.4	0.12
960515	1900	0.76	0.201	0.210	4.98	4.75	-22.0	-14.0	-15.6	30.8	30.4	25.6	0.13
960515	2200	0.67	0.210	0.210	4.75	4.75	-16.0	-14.0	-21.3	32.3	31.0	23.9	0.07
960516	0100	0.73	0.123	0.181	8.16	5.52	-34.0	-22.0	-29.5	28.2	27.7	23.3	0.07
960516	0400	0.77	0.181	0.181	5.52	5.52	-20.0	-18.0	-29.6	30.1	30.0	26.5	0.11
960516	0700	0.83	0.181	0.171	5.52	5.83	-44.0	-44.0	-42.1	30.0	28.7	26.0	0.11
960516	1000	0.90	0.162	0.162	6.19	6.19	-40.0	-42.0	-35.3	28.8	25.4	23.0	0.07
960516	1300	0.94	0.142	0.162	7.04	6.19	-12.0	-16.0	-28.8	30.3	24.6	25.6	0.09
960516	1600	1.02	0.132	0.162	7.56	6.19	-6.0	-12.0	-23.7	30.5	24.4	25.1	0.14
960516	1900	1.00	0.142	0.142	7.04	7.04	-12.0	-12.0	-27.4	32.0	26.8	22.9	0.14
960516	2200	0.87	0.162	0.142	6.19	7.04	-42.0	-40.0	-26.4	30.6	25.0	25.4	0.08
960517	0100	0.84	0.152	0.152	6.59	6.59	-42.0	-42.0	-27.3	32.1	26.2	24.1	0.07
960517	0400	0.82	0.152	0.152	6.59	6.59	-40.0	-42.0	-29.0	33.7	25.4	18.5	0.11
960517	0700	0.79	0.162	0.103	6.19	9.71	-44.0	-46.0	-27.8	37.2	28.5	26.3	0.15
960517	1000	0.70	0.162	0.103	6.19	9.71	-48.0	-4.0	-20.0	36.0	31.9	33.3	0.09
960517	1300	0.68	0.103	0.103	9.71	9.71	-36.0	-36.0	-23.0	34.3	33.0	35.6	0.08
960517	1600	0.66	0.113	0.113	8.87	8.87	-36.0	-38.0	-30.3	33.0	31.3	31.8	0.14
960517	1900	0.63	0.132	0.113	7.56	8.87	-40.0	-40.0	-31.9	34.9	31.9	28.1	0.18
960517	2200	0.62	0.113	0.113	8.87	8.87	-28.0	-32.0	-29.9	34.3	31.7	28.8	0.11
960518	0100	0.57	0.113	0.113	8.87	8.87	-34.0	-34.0	-24.7	31.4	31.0	30.6	0.08
960518	0400	0.59	0.113	0.113	8.87	8.87	-10.0	-10.0	-22.1	31.7	31.6	26.0	0.12
960518	0700	0.58	0.113	0.113	8.87	8.87	-34.0	-8.0	-26.6	31.7	33.2	28.5	0.20
960518	1000	0.51	0.113	0.113	8.87	8.87	-32.0	-32.0	-24.6	32.2	33.2	29.6	0.13
960518	1300	0.49	0.103	0.103	9.71	9.71	-32.0	-32.0	-32.4	31.7	32.9	33.3	0.10
960518	1600	0.51	0.123	0.113	8.16	8.87	-36.0	-34.0	-20.4	30.3	30.5	30.3	0.15
960518	1900	0.54	0.123	0.113	8.16	8.87	-34.0	-34.0	-28.2	31.8	32.6	30.7	0.22
960518	2200	0.54	0.113	0.113	8.87	8.87	-6.0	-10.0	-19.3	30.5	31.3	30.7	0.16
960519	0100	0.55	0.113	0.113	8.87	8.87	-8.0	-10.0	-19.2	28.5	28.7	27.6	0.10
960519	0400	0.59	0.113	0.113	8.87	8.87	-34.0	-34.0	-25.1	28.7	29.7	29.4	0.12
960519	0700	0.60	0.113	0.113	8.87	8.87	-4.0	-8.0	-10.9	32.3	31.7	29.6	0.20
960519	1000	0.59	0.113	0.113	8.87	8.87	-8.0	-8.0	-17.3	28.9	29.0	20.5	0.15
960519	1300	0.56	0.123	0.123	8.16	8.16	-8.0	-6.0	-8.8	30.0	29.6	23.7	0.12
960519	1600	0.57	0.113	0.113	8.87	8.87	-2.0	-2.0	-7.1	31.1	28.8	30.1	0.15

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
960519	1900	0.54	0.113	0.113	8.87	8.87	-2.0	-4.0	-8.2	29.5	30.1	27.3	0.25
960519	2200	0.52	0.113	0.113	8.87	8.87	-2.0	-6.0	-8.3	30.3	29.0	29.5	0.26
960520	0100	0.52	0.074	0.113	13.56	8.87	-4.0	-2.0	-5.7	30.3	28.4	30.7	0.14
960520	0400	0.53	0.074	0.083	13.56	11.98	0.0	0.0	-4.0	30.0	28.0	18.9	0.22
960520	0700	0.53	0.074	0.083	13.56	11.98	-10.0	-8.0	-11.7	32.1	29.0	21.7	0.30
960520	1000	0.50	0.083	0.083	11.98	11.98	8.0	0.0	-10.2	31.3	29.0	24.7	0.28
960520	1300	0.54	0.083	0.083	11.98	11.98	6.0	4.0	-3.5	26.3	25.3	20.6	0.18
960520	1600	0.59	0.083	0.083	11.98	11.98	10.0	6.0	0.6	27.1	25.8	21.0	0.18
960520	1900	0.59	0.083	0.083	11.98	11.98	4.0	2.0	-3.8	28.1	25.5	19.3	0.22
960520	2200	0.57	0.074	0.083	13.56	11.98	-4.0	-2.0	-3.9	28.0	24.4	23.4	0.26
960521	0100	0.57	0.083	0.083	11.98	11.98	8.0	8.0	-1.4	25.9	23.5	18.3	0.23
960521	0400	0.56	0.083	0.083	11.98	11.98	4.0	2.0	0.6	24.4	24.2	20.0	0.21
960521	0700	0.54	0.083	0.083	11.98	11.98	8.0	4.0	-1.6	27.2	25.4	24.3	0.27
960521	1000	0.51	0.083	0.083	11.98	11.98	4.0	4.0	-6.0	29.2	25.2	21.6	0.32
960521	1300	0.51	0.083	0.083	11.98	11.98	4.0	4.0	-10.2	32.4	24.4	23.9	0.33
960521	1600	0.53	0.083	0.083	11.98	11.98	6.0	-58.0	-16.6	54.4	22.0	23.2	0.27
960521	1900	0.50	0.083	0.083	11.98	11.98	6.0	6.0	-11.1	44.0	23.3	25.5	0.30
960521	2200	0.45	0.083	0.083	11.98	11.98	4.0	4.0	-13.4	41.2	23.8	22.6	0.33
960522	0100	0.41	0.083	0.083	11.98	11.98	6.0	4.0	-10.3	35.3	26.7	23.7	0.48
960522	0400	0.40	0.083	0.083	11.98	11.98	4.0	6.0	-10.0	40.4	28.7	29.6	0.30
960522	0700	0.44	0.093	0.083	10.72	11.98	10.0	8.0	-11.6	46.3	25.8	27.5	0.27
960522	1000	0.51	0.142	0.083	7.04	11.98	-44.0	-44.0	-4.3	63.8	40.1	27.6	0.20
960522	1300	0.42	0.093	0.093	10.72	10.72	6.0	6.0	-26.1	54.8	39.6	19.0	0.32
960522	1600	0.34	0.093	0.093	10.72	10.72	6.0	6.0	-12.7	49.0	46.4	-26.1	0.32
960522	1900	0.33	0.093	0.093	10.72	10.72	4.0	4.0	-2.4	47.5	43.5	28.6	0.25
960522	2200	0.33	0.093	0.093	10.72	10.72	4.0	4.0	3.6	52.3	36.8	21.9	0.22
960523	0100	0.33	0.093	0.093	10.72	10.72	6.0	8.0	-0.6	52.5	37.9	25.8	0.30
960523	0400	0.31	0.103	0.093	9.71	10.72	4.0	4.0	-10.3	47.8	32.7	31.9	0.28
960523	0700	0.34	0.171	0.093	5.83	10.72	-46.0	-46.0	-21.0	45.4	27.3	24.1	0.29
960523	1000	0.34	0.142	0.162	7.04	6.19	-20.0	-22.0	-22.2	35.9	27.0	22.0	0.22
960523	1300	0.34	0.162	0.093	6.19	10.72	-30.0	-30.0	-20.0	30.9	25.1	24.9	0.27
960523	1600	0.35	0.142	0.142	7.04	7.04	-20.0	-22.0	-22.3	27.4	23.8	15.0	0.23
960523	1900	0.39	0.152	0.152	6.59	6.59	-22.0	-38.0	-27.3	24.7	24.6	14.9	0.20
960523	2200	0.43	0.142	0.142	7.04	7.04	-42.0	-42.0	-32.0	26.1	24.2	21.0	0.18
960524	0100	0.48	0.162	0.152	6.19	6.59	-40.0	-40.0	-32.9	21.6	22.7	16.5	0.17
960524	0400	0.49	0.113	0.103	8.87	9.71	-36.0	-36.0	-33.2	22.4	22.3	31.1	0.15
960524	0700	0.50	0.103	0.113	9.71	8.87	-30.0	-32.0	-31.5	22.6	23.3	20.6	0.16
960524	1000	0.48	0.113	0.123	8.87	8.16	-38.0	-38.0	-38.4	23.7	23.6	18.6	0.17
960524	1300	0.44	0.113	0.113	8.87	8.87	-38.0	-38.0	-36.9	22.8	22.6	22.0	0.19
960524	1600	0.41	0.113	0.113	8.87	8.87	-34.0	-36.0	-38.4	32.8	21.8	19.0	0.20
960524	1900	0.39	0.123	0.113	8.16	8.87	-42.0	-40.0	-36.3	33.2	25.1	27.3	0.21
960524	2200	0.40	0.132	0.123	7.56	8.16	-40.0	-56.0	-38.8	37.0	24.1	27.6	0.21
960525	0100	0.36	0.123	0.113	8.16	8.87	-38.0	-44.0	-29.6	36.9	28.7	25.8	0.20
960525	0400	0.33	0.123	0.113	8.16	8.87	-38.0	-42.0	-30.5	40.3	32.2	32.9	0.26
960525	0700	0.48	0.123	0.318	8.16	3.15	-38.0	22.0	0.4	58.1	35.5	27.2	0.21
960525	1000	0.91	0.230	0.240	4.35	4.17	36.0	38.0	27.6	31.4	27.4	32.9	0.14
960525	1300	1.00	0.201	0.220	4.98	4.54	46.0	46.0	36.4	32.7	27.5	31.1	0.21
960525	1600	0.98	0.191	0.191	5.24	5.24	44.0	42.0	39.0	21.3	19.8	11.1	0.14
960525	1900	1.02	0.210	0.210	4.75	4.75	38.0	40.0	36.3	26.2	22.0	13.2	0.10
960525	2200	1.06	0.162	0.162	6.19	6.19	34.0	34.0	28.4	45.9	39.1	37.5	0.13
960526	0100	0.85	0.162	0.152	6.19	6.59	36.0	36.0	29.4	49.8	44.0	45.7	0.14
960526	0400	0.75	0.152	0.152	6.59	6.59	28.0	36.0	19.5	50.4	43.2	39.3	0.10
960526	0700	0.72	0.162	0.162	6.19	6.19	28.0	30.0	15.2	49.8	40.1	49.8	0.07

(Sheet 39 of 54)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
960526	1000	0.82	0.181	0.181	5.52	5.52	28.0	28.0	11.0	45.0	36.6	33.3	0.09
960526	1300	0.82	0.210	0.191	4.75	5.24	24.0	28.0	12.2	45.4	35.6	45.6	0.11
960526	1600	0.72	0.142	0.210	7.04	4.75	-18.0	-14.0	7.1	49.4	36.5	41.4	0.11
960526	1900	0.66	0.123	0.191	8.16	5.24	-10.0	-12.0	0.6	38.4	33.2	33.3	0.08
960526	2200	0.70	0.181	0.201	5.52	4.98	-12.0	-10.0	-5.3	29.2	29.0	28.1	0.10
960527	0100	0.64	0.132	0.142	7.56	7.04	-12.0	-6.0	-5.4	32.3	30.9	23.8	0.15
960527	0400	0.60	0.123	0.132	8.16	7.56	-10.0	-8.0	0.8	28.2	27.4	17.0	0.12
960527	0700	0.59	0.142	0.142	7.04	7.04	-10.0	-2.0	-1.4	27.6	28.2	18.6	0.09
960527	1000	0.65	0.142	0.142	7.04	7.04	-10.0	-10.0	0.2	28.0	28.6	11.8	0.10
960527	1300	0.75	0.171	0.181	5.83	5.52	18.0	16.0	6.9	30.5	29.6	23.1	0.13
960527	1600	1.32	0.201	0.201	4.98	4.98	14.0	10.0	12.5	24.9	26.0	19.7	0.08
960527	1900	1.47	0.171	0.171	5.83	5.83	20.0	12.0	10.9	27.5	27.9	17.5	0.07
960527	2200	1.39	0.142	0.142	7.04	7.04	10.0	12.0	10.0	24.1	26.3	12.0	0.07
960528	0100	1.32	0.142	0.142	7.04	7.04	6.0	6.0	8.5	19.6	23.7	11.9	0.09
960528	0400	1.16	0.132	0.132	7.56	7.56	10.0	8.0	9.9	18.1	21.9	9.6	0.10
960528	0700	1.00	0.142	0.132	7.04	7.56	8.0	8.0	11.4	18.7	21.2	14.7	0.08
960528	1000	1.31	0.103	0.103	9.71	9.71	6.0	8.0	9.3	17.1	18.0	14.6	0.09
960528	1300	1.41	0.103	0.103	9.71	9.71	6.0	8.0	9.3	18.0	18.5	13.4	0.15
960528	1600	1.34	0.103	0.103	9.71	9.71	8.0	10.0	10.5	22.6	18.4	17.2	0.15
960528	1900	1.38	0.132	0.103	7.56	9.71	8.0	6.0	10.9	23.1	17.8	19.1	0.12
960528	2200	1.41	0.123	0.123	8.16	8.16	2.0	4.0	11.3	22.2	19.5	10.6	0.11
960529	0100	1.37	0.113	0.113	8.87	8.87	6.0	6.0	10.0	22.6	20.0	16.9	0.12
960529	0400	1.23	0.142	0.123	7.04	8.16	10.0	8.0	11.6	24.7	22.0	22.0	0.12
960529	0700	1.00	0.113	0.113	8.87	8.87	4.0	8.0	10.9	21.4	18.2	17.4	0.10
960529	1000	0.90	0.132	0.132	7.56	7.56	6.0	6.0	9.2	19.2	18.6	13.1	0.10
960529	1300	0.87	0.132	0.123	7.56	8.16	6.0	6.0	8.3	22.5	21.3	14.8	0.12
960529	1600	0.83	0.123	0.123	8.16	8.16	4.0	4.0	8.9	23.0	23.4	18.7	0.15
960529	1900	1.03	0.123	0.113	8.16	8.87	2.0	6.0	16.4	27.3	21.3	20.9	0.11
960529	2200	1.24	0.113	0.113	8.87	8.87	4.0	6.0	18.9	29.3	22.9	17.1	0.11
960530	0100	1.26	0.181	0.181	5.52	5.52	10.0	12.0	17.9	30.0	25.4	20.2	0.11
960530	0400	1.20	0.191	0.201	5.24	4.98	36.0	38.0	26.0	31.5	24.3	23.4	0.14
960530	0700	1.20	0.191	0.201	5.24	4.98	20.0	16.0	21.2	30.0	23.6	25.7	0.12
960530	1000	1.03	0.220	0.201	4.54	4.98	36.0	36.0	26.4	30.8	22.5	19.1	0.10
960530	1300	1.18	0.191	0.191	5.24	5.24	34.0	36.0	27.1	28.0	20.9	20.4	0.16
960530	1600	1.09	0.201	0.191	4.98	5.24	36.0	36.0	26.2	30.3	24.1	26.7	0.16
960530	1900	1.05	0.181	0.181	5.52	5.52	34.0	10.0	23.4	30.8	26.5	25.0	0.12
960530	2200	0.94	0.171	0.171	5.83	5.83	24.0	12.0	22.0	30.4	25.8	22.4	0.08
960531	0100	0.87	0.162	0.171	6.19	5.83	10.0	10.0	13.7	27.2	25.2	19.8	0.08
960531	0400	0.79	0.152	0.123	6.59	8.16	8.0	8.0	14.4	27.0	25.4	20.3	0.11
960531	0700	0.77	0.181	0.103	5.52	9.71	32.0	8.0	15.8	33.8	28.8	28.5	0.10
960531	1000	0.78	0.103	0.103	9.71	9.71	6.0	4.0	14.0	31.1	28.1	21.4	0.08
960531	1300	0.82	0.113	0.113	8.87	8.87	6.0	6.0	10.9	31.1	30.1	28.0	0.09
960531	1600	0.79	0.103	0.113	9.71	8.87	-8.0	-4.0	4.3	32.7	34.6	22.3	0.12
960531	1900	0.72	0.123	0.123	8.16	8.16	-8.0	-4.0	-3.7	33.1	35.1	21.6	0.13
960531	2200	0.66	0.103	0.103	9.71	9.71	2.0	2.0	-4.9	32.1	33.7	21.3	0.09
960601	0100	0.65	0.113	0.123	8.87	8.16	4.0	4.0	1.8	33.6	34.1	30.6	0.08
960601	0400	0.66	0.123	0.123	8.16	8.16	-4.0	4.0	-8.3	34.5	34.4	22.5	0.11
960601	0700	0.63	0.123	0.113	8.16	8.87	0.0	0.0	-5.1	33.0	32.2	22.4	0.11
960601	1000	0.63	0.123	0.123	8.16	8.16	0.0	0.0	-10.8	27.0	27.4	19.4	0.09
960601	1300	0.65	0.123	0.123	8.16	8.16	2.0	0.0	-6.9	27.4	26.2	17.5	0.09
960601	1600	0.68	0.123	0.123	8.16	8.16	2.0	0.0	-21.1	36.1	29.5	18.7	0.13
960601	1900	0.71	0.279	0.279	3.59	3.59	-46.0	-46.0	-31.1	40.3	31.6	30.8	0.15
960601	2200	0.68	0.162	0.269	6.19	3.72	-34.0	-36.0	-31.9	36.3	30.0	32.5	0.12

Appendix A Table of Collection Times and Bulk Parameters

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	x
960602	0100	0.64	0.162	0.142	6.19	7.04	-38.0	-40.0	-24.2	35.9	30.5	30.4	0.09
960602	0400	0.66	0.171	0.152	5.83	6.59	-44.0	-44.0	-27.0	34.9	27.3	21.4	0.10
960602	0700	0.75	0.152	0.142	6.59	7.04	-44.0	-42.0	-29.9	31.6	27.8	27.8	0.11
960602	1000	0.89	0.132	0.132	7.56	7.56	-18.0	-18.0	-21.0	29.0	26.8	25.3	0.09
960602	1300	1.06	0.123	0.123	8.16	8.16	-12.0	-14.0	-21.4	24.9	24.4	21.2	0.09
960602	1600	1.27	0.113	0.113	8.87	8.87	-10.0	-14.0	-17.7	23.4	23.4	19.4	0.10
960602	1900	1.26	0.113	0.113	8.87	8.87	-8.0	-10.0	-15.5	24.5	24.1	17.0	0.12
960602	2200	1.30	0.113	0.113	8.87	8.87	-8.0	-8.0	-6.1	25.0	26.3	19.8	0.09
960603	0100	1.40	0.113	0.113	8.87	8.87	-8.0	-8.0	-6.5	23.3	23.8	20.6	0.08
960603	0400	1.73	0.103	0.103	9.71	9.71	-8.0	-8.0	1.0	26.4	24.1	19.4	0.09
960603	0700	2.08	0.093	0.103	10.72	9.71	-28.0	-4.0	6.2	43.0	23.1	22.7	0.16
960603	1000	1.94	0.093	0.093	10.72	10.72	-2.0	40.0	13.4	47.0	21.3	20.5	0.13
960603	1300	1.69	0.093	0.093	10.72	10.72	0.0	36.0	14.0	42.4	18.7	20.3	0.11
960603	1600	1.41	0.103	0.103	9.71	9.71	-2.0	-2.0	11.1	40.3	20.9	20.3	0.10
960603	1900	1.23	0.103	0.103	9.71	9.71	-2.0	-2.0	11.8	36.8	19.7	18.4	0.11
960603	2200	1.14	0.103	0.103	9.71	9.71	-2.0	0.0	9.3	28.5	19.7	17.5	0.10
960604	0100	1.06	0.113	0.103	8.87	9.71	-4.0	-2.0	6.7	23.2	21.4	20.6	0.08
960604	0400	1.05	0.113	0.113	8.87	8.87	-2.0	-2.0	2.8	25.7	26.6	23.5	0.09
960604	0700	0.90	0.113	0.113	8.87	8.87	-12.0	-8.0	-1.6	25.4	26.0	18.8	0.10
960604	1000	0.76	0.113	0.113	8.87	8.87	-10.0	-8.0	-5.7	29.3	28.7	21.7	0.10
960604	1300	0.74	0.113	0.113	8.87	8.87	-6.0	-8.0	-12.8	31.1	28.8	22.4	0.09
960604	1600	0.73	0.123	0.123	8.16	8.16	-10.0	-10.0	-18.4	31.3	27.3	24.8	0.10
960604	1900	0.75	0.123	0.123	8.16	8.16	-14.0	-16.0	-22.4	28.1	24.5	23.8	0.13
960604	2200	0.68	0.123	0.123	8.16	8.16	-10.0	-12.0	-23.6	28.8	26.0	20.4	0.12
960605	0100	0.66	0.123	0.113	8.16	8.87	-10.0	-10.0	-19.7	28.8	24.8	26.2	0.09
960605	0400	0.64	0.123	0.113	8.16	8.87	-34.0	-10.0	-26.0	28.7	25.2	27.2	0.09
960605	0700	0.67	0.123	0.113	8.16	8.87	-36.0	-16.0	-26.3	30.4	26.4	28.2	0.12
960605	1000	0.66	0.113	0.123	8.87	8.16	-8.0	-10.0	-19.9	32.5	26.8	27.3	0.12
960605	1300	0.66	0.113	0.113	8.87	8.87	-10.0	-8.0	-14.3	28.6	25.5	19.0	0.09
960605	1600	0.65	0.123	0.123	8.16	8.16	-8.0	-8.0	-14.3	29.5	28.1	25.1	0.10
960605	1900	0.70	0.123	0.123	8.16	8.16	-8.0	-10.0	-12.2	28.8	29.1	28.5	0.10
960605	2200	0.62	0.123	0.123	8.16	8.16	-38.0	-38.0	-25.5	33.0	33.9	30.8	0.12
960606	0100	0.59	0.123	0.123	8.16	8.16	-38.0	-40.0	-34.0	33.9	32.6	30.4	0.10
960606	0400	0.62	0.132	0.123	7.56	8.16	-36.0	-38.0	-28.1	30.7	28.6	25.8	0.08
960606	0700	0.62	0.113	0.123	8.87	8.16	-34.0	-10.0	-24.8	31.7	30.2	27.2	0.11
960606	1000	0.64	0.113	0.113	8.87	8.87	-36.0	-38.0	-32.3	33.4	32.5	23.3	0.12
960606	1300	0.61	0.113	0.113	8.87	8.87	-36.0	-8.0	-22.0	34.8	34.1	27.5	0.11
960606	1600	0.62	0.113	0.113	8.87	8.87	-34.0	-36.0	-33.1	31.7	32.6	27.4	0.09
960606	1900	0.62	0.113	0.113	8.87	8.87	-30.0	-38.0	-35.1	31.1	31.2	21.9	0.11
960606	2200	0.59	0.123	0.123	8.16	8.16	-36.0	-38.0	-36.0	33.0	32.4	24.5	0.14
960607	0100	0.55	0.132	0.123	7.56	8.16	-40.0	-40.0	-37.7	35.5	32.1	31.1	0.14
960607	0400	0.54	0.113	0.113	8.87	8.87	-36.0	-6.0	-27.6	35.4	33.6	28.8	0.10
960607	0700	0.60	0.113	0.113	8.87	8.87	-36.0	-6.0	-17.8	32.7	33.7	30.7	0.11
960607	1000	0.63	0.113	0.113	8.87	8.87	-34.0	-8.0	-24.9	31.3	32.8	24.7	0.13
960607	1300	0.57	0.123	0.113	8.16	8.87	-38.0	-8.0	-25.3	33.4	33.1	30.0	0.14
960607	1600	0.54	0.123	0.113	8.16	8.87	-38.0	-38.0	-33.3	31.2	30.9	31.8	0.11
960607	1900	0.55	0.132	0.113	7.56	8.87	-34.0	-36.0	-35.8	29.8	28.8	29.2	0.11
960607	2200	0.54	0.113	0.113	8.87	8.87	-32.0	-34.0	-38.2	30.3	26.7	16.0	0.14
960608	0100	0.54	0.113	0.123	8.87	8.16	-38.0	-40.0	-39.9	32.3	26.3	31.6	0.15
960608	0400	0.58	0.113	0.123	8.87	8.16	-36.0	-38.0	-40.5	33.2	25.8	28.9	0.11
960608	0700	0.61	0.123	0.123	8.16	8.16	-32.0	-42.0	-38.2	33.0	28.2	23.8	0.10
960608	1000	0.63	0.132	0.132	7.56	7.56	-38.0	-42.0	-41.4	30.7	25.9	21.1	0.14
960608	1300	0.59	0.191	0.123	5.24	8.16	-48.0	-46.0	-42.3	30.3	21.6	28.0	0.16
960608	1600	0.55	0.123	0.123	8.16	8.16	-36.0	-38.0	-40.8	26.3	20.2	27.3	0.14

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Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
960608	1900	0.53	0.152	0.123	6.59	8.16	-40.0	-38.0	-40.7	26.8	18.6	28.0	0.12
960608	2200	0.52	0.142	0.123	7.04	8.16	-38.0	-40.0	-40.3	29.4	21.5	29.0	0.14
960609	0100	0.51	0.142	0.142	7.04	7.04	-38.0	-40.0	-38.6	29.4	26.4	23.8	0.17
960609	0400	0.52	0.132	0.142	7.56	7.04	-38.0	-40.0	-37.9	29.9	27.0	24.1	0.13
960609	0700	0.56	0.152	0.152	6.59	6.59	-42.0	-42.0	-38.2	28.6	25.1	19.2	0.10
960609	1000	0.68	0.162	0.162	6.19	6.19	-42.0	-42.0	-40.3	25.2	21.4	10.5	0.12
960609	1300	0.66	0.152	0.162	6.59	6.19	-40.0	-44.0	-41.6	21.2	16.6	10.6	0.16
960609	1600	0.59	0.142	0.142	7.04	7.04	-44.0	-44.0	-44.5	27.3	19.7	22.7	0.15
960609	1900	0.58	0.142	0.142	7.04	7.04	-40.0	-44.0	-43.6	31.8	24.6	31.9	0.11
960609	2200	0.57	0.162	0.152	6.19	6.59	-44.0	-42.0	-41.1	31.3	27.7	26.4	0.12
960610	0100	0.65	0.171	0.152	5.83	6.59	-46.0	-46.0	-39.4	31.0	29.4	28.3	0.16
960610	0400	0.68	0.152	0.152	6.59	6.59	-40.0	-44.0	-40.5	25.1	22.6	15.0	0.13
960610	0700	0.69	0.152	0.152	6.59	6.59	-42.0	-42.0	-41.4	21.8	20.9	11.1	0.09
960610	1000	0.69	0.142	0.152	7.04	6.59	-42.0	-44.0	-41.4	24.4	21.1	20.6	0.12
960610	1300	0.62	0.152	0.152	6.59	6.59	-42.0	-46.0	-41.8	27.3	19.9	11.6	0.16
960610	1600	0.60	0.152	0.152	6.59	6.59	-42.0	-44.0	-40.2	28.3	22.5	22.1	0.18
960610	1900	0.63	0.152	0.152	6.59	6.59	-40.0	-40.0	-41.0	24.5	20.2	12.6	0.11
960610	2200	0.59	0.132	0.132	7.56	7.56	-38.0	-38.0	-40.5	27.7	25.7	27.6	0.13
960611	0100	0.58	0.152	0.123	6.59	8.16	-44.0	-42.0	-41.0	26.6	25.0	23.0	0.15
960611	0400	0.55	0.132	0.132	7.56	7.56	-40.0	-40.0	-39.0	26.1	24.2	16.7	0.17
960611	0700	0.60	0.113	0.132	8.87	7.56	-34.0	-34.0	-37.1	23.3	21.9	19.7	0.12
960611	1000	0.61	0.123	0.123	8.16	8.16	-40.0	-38.0	-36.2	25.5	24.6	22.1	0.12
960611	1300	0.61	0.123	0.132	8.16	7.56	-36.0	-36.0	-33.5	26.5	26.6	23.5	0.15
960611	1600	0.63	0.132	0.142	7.56	7.04	-40.0	-42.0	-36.4	28.5	26.4	26.3	0.16
960611	1900	0.71	0.132	0.132	7.56	7.56	-40.0	-48.0	-42.3	27.2	21.0	27.2	0.15
960611	2200	0.60	0.152	0.132	6.59	7.56	-40.0	-50.0	-39.9	33.5	21.5	31.1	0.13
960612	0100	0.53	0.152	0.142	6.59	7.04	-40.0	-44.0	-36.7	33.4	21.0	28.3	0.14
960612	0400	0.55	0.132	0.132	7.56	7.56	-36.0	-38.0	-39.8	28.0	22.5	21.2	0.17
960612	0700	0.56	0.142	0.142	7.04	7.04	-40.0	-42.0	-36.6	27.5	23.4	21.3	0.13
960612	1000	0.60	0.171	0.152	5.83	6.59	-40.0	-40.0	-32.8	26.1	24.2	24.0	0.11
960612	1300	0.61	0.162	0.162	6.19	6.19	-42.0	-42.0	-39.9	25.2	23.4	24.0	0.13
960612	1600	0.59	0.318	0.093	3.15	10.72	-48.0	-44.0	-40.1	21.8	16.7	20.5	0.19
960612	1900	0.50	0.162	0.093	6.19	10.72	-42.0	-48.0	-41.3	24.8	16.1	19.6	0.18
960612	2200	0.39	0.152	0.093	6.59	10.72	-42.0	-50.0	-34.2	35.0	21.9	29.4	0.15
960613	0100	0.41	0.162	0.093	6.19	10.72	-44.0	-44.0	-39.1	33.7	22.9	32.4	0.15
960613	0400	0.47	0.162	0.093	6.19	10.72	-46.0	-50.0	-42.9	32.1	23.0	27.8	0.15
960613	0700	0.50	0.162	0.162	6.19	6.19	-46.0	-48.0	-40.3	31.6	22.8	14.0	0.14
960613	1000	0.48	0.152	0.152	6.59	6.59	-46.0	-46.0	-40.2	33.0	24.9	23.9	0.10
960613	1300	0.45	0.152	0.152	6.59	6.59	-46.0	-46.0	-38.7	32.2	27.0	22.9	0.14
960613	1600	0.42	0.162	0.113	6.19	8.87	-48.0	-50.0	-40.8	38.2	25.0	24.1	0.17
960613	1900	0.38	0.123	0.123	8.16	8.16	-38.0	-38.0	-40.4	37.1	28.2	25.5	0.21
960613	2200	0.39	0.162	0.123	6.19	8.16	-48.0	-42.0	-39.6	38.5	21.5	27.7	0.14
960614	0100	0.39	0.132	0.123	7.56	8.16	-42.0	-44.0	-41.4	32.4	22.6	25.9	0.15
960614	0400	0.43	0.152	0.152	6.59	6.59	-46.0	-46.0	-42.6	33.6	19.7	8.1	0.16
960614	0700	0.41	0.152	0.113	6.59	8.87	-44.0	-44.0	-42.5	38.1	28.7	31.4	0.18
960614	1000	0.35	0.152	0.123	6.59	8.16	-42.0	-42.0	-36.4	34.2	30.5	25.9	0.14
960614	1300	0.34	0.142	0.123	7.04	8.16	-40.0	-40.0	-36.9	32.5	26.4	25.3	0.18
960614	1600	0.32	0.132	0.123	7.56	8.16	-40.0	-42.0	-37.2	31.7	21.7	23.9	0.21
960614	1900	0.31	0.132	0.132	7.56	7.56	-40.0	-42.0	-41.1	32.4	21.5	13.0	0.25
960614	2200	0.33	0.152	0.123	6.59	8.16	-44.0	-44.0	-42.1	30.1	21.2	21.8	0.20
960615	0100	0.35	0.132	0.132	7.56	7.56	-40.0	-40.0	-41.5	29.3	21.5	9.2	0.19
960615	0400	0.36	0.132	0.123	7.56	8.16	-40.0	-38.0	-39.4	27.8	21.8	19.4	0.22
960615	0700	0.35	0.142	0.142	7.04	7.04	-38.0	-40.0	-37.7	24.6	22.6	12.7	0.23

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Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
960615	1000	0.35	0.142	0.142	7.04	7.04	-40.0	-40.0	-36.9	28.8	24.1	10.6	0.17
960615	1300	0.37	0.132	0.132	7.56	7.56	-36.0	-36.0	-42.7	29.1	16.6	10.9	0.17
960615	1600	0.34	0.132	0.132	7.56	7.56	-38.0	-40.0	-43.0	28.0	16.5	15.8	0.23
960615	1900	0.39	0.191	0.201	5.24	4.98	-58.0	-60.0	-50.2	31.4	16.7	8.5	0.21
960615	2200	0.37	0.132	0.132	7.56	7.56	-40.0	-40.0	-46.5	35.7	17.9	13.2	0.24
960616	0100	0.34	0.132	0.132	7.56	7.56	-38.0	-38.0	-43.4	28.5	21.4	12.6	0.17
960616	0400	0.36	0.142	0.142	7.04	7.04	-38.0	-38.0	-42.3	30.9	20.4	10.6	0.23
960616	0700	0.34	0.132	0.123	7.56	8.16	-40.0	-40.0	-45.3	33.1	21.8	23.1	0.26
960616	1000	0.33	0.123	0.103	8.16	9.71	-38.0	-40.0	-43.1	36.8	21.0	29.2	0.29
960616	1300	0.33	0.123	0.123	8.16	8.16	-40.0	-42.0	-43.3	37.2	21.3	25.5	0.23
960616	1600	0.34	0.132	0.132	7.56	7.56	-42.0	-42.0	-43.3	31.8	17.6	9.6	0.29
960616	1900	0.34	0.132	0.132	7.56	7.56	-40.0	-40.0	-42.5	22.9	14.0	6.7	0.25
960616	2200	0.34	0.132	0.132	7.56	7.56	-40.0	-40.0	-41.7	22.8	16.2	7.3	0.28
960617	0100	0.33	0.142	0.123	7.04	8.16	-42.0	-40.0	-39.9	20.9	15.9	10.9	0.19
960617	0400	0.38	0.132	0.132	7.56	7.56	-36.0	-38.0	-40.1	26.1	17.6	12.2	0.26
960618	1000	0.41	0.113	0.113	8.87	8.87	-36.0	-36.0	-42.3	26.7	17.4	13.0	0.24
960618	1300	0.42	0.113	0.113	8.87	8.87	-34.0	-36.0	-38.1	22.9	18.9	14.0	0.19
960618	1600	0.47	0.113	0.113	8.87	8.87	-38.0	-38.0	-41.9	22.6	15.0	13.6	0.22
960618	1900	0.44	0.113	0.113	8.87	8.87	-38.0	-38.0	-41.1	19.4	12.6	9.9	0.24
960618	2200	0.43	0.113	0.123	8.87	8.16	-40.0	-40.0	-41.0	19.9	15.8	11.4	0.24
960619	0100	0.43	0.123	0.123	8.16	8.16	-36.0	-36.0	-39.9	20.3	15.9	12.0	0.17
960619	0400	0.47	0.123	0.123	8.16	8.16	-38.0	-42.0	-42.2	23.2	15.5	13.2	0.20
960619	0700	0.55	0.123	0.123	8.16	8.16	-40.0	-42.0	-47.7	25.4	18.1	14.8	0.23
960619	1000	0.55	0.123	0.132	8.16	7.56	-42.0	-42.0	-46.1	23.3	19.2	18.8	0.21
960619	1300	0.56	0.123	0.123	8.16	8.16	-38.0	-40.0	-44.6	20.1	15.2	10.8	0.15
960619	1600	0.58	0.132	0.132	7.56	7.56	-40.0	-42.0	-45.5	18.6	14.5	9.0	0.17
960619	1900	0.65	0.152	0.132	6.59	7.56	-46.0	-50.0	-48.3	19.8	15.2	10.9	0.21
960619	2200	0.70	0.152	0.152	6.59	6.59	-46.0	-48.0	-49.0	21.1	18.2	6.8	0.17
960620	0100	0.76	0.152	0.152	6.59	6.59	-46.0	-46.0	-47.1	23.0	22.0	7.8	0.12
960620	0400	0.75	0.152	0.142	6.59	7.04	-46.0	-44.0	-42.8	27.8	29.0	15.9	0.11
960620	0700	0.65	0.132	0.132	7.56	7.56	-42.0	-42.0	-16.6	50.6	42.9	15.1	0.18
960620	1000	0.51	0.132	0.132	7.56	7.56	-42.0	-42.0	-15.7	52.3	36.8	9.8	0.21
960620	1300	0.43	0.132	0.132	7.56	7.56	-40.0	-42.0	-13.6	49.3	39.8	25.0	0.17
960620	1600	0.46	0.142	0.132	7.04	7.56	-44.0	-44.0	-10.2	64.4	34.3	26.7	0.14
960620	1900	0.41	0.142	0.142	7.04	7.04	-44.0	-44.0	-22.3	48.0	39.3	10.8	0.19
960620	2200	0.40	0.142	0.142	7.04	7.04	-42.0	-42.0	-44.0	42.6	41.3	10.1	0.22
960621	0100	0.36	0.152	0.142	6.59	7.04	-46.0	-42.0	-46.5	38.6	35.4	14.8	0.22
960621	0400	0.33	0.142	0.142	7.04	7.04	-42.0	-42.0	-47.2	43.7	37.1	13.0	0.19
960621	0700	0.32	0.152	0.113	6.59	8.87	-46.0	-46.0	-35.4	43.6	39.1	24.7	0.24
960621	1000	0.34	0.142	0.113	7.04	8.87	-46.0	-48.0	-38.6	45.7	38.9	21.3	9.99
960621	1300	0.34	0.103	0.103	9.71	9.71	-34.0	-38.0	-41.7	45.9	46.7	19.0	9.99
960621	1600	0.35	0.113	0.113	8.87	8.87	-36.0	-36.0	-19.7	47.1	33.9	14.3	0.21
960621	1900	0.38	0.113	0.113	8.87	8.87	-38.0	-44.0	-43.3	41.6	40.5	23.2	0.21
960621	2200	0.38	0.113	0.113	8.87	8.87	-36.0	-42.0	-40.6	50.3	49.9	15.8	0.21
960622	0100	0.33	0.113	0.103	8.87	9.71	-38.0	-38.0	-36.6	56.1	54.1	27.4	0.24
960622	0400	0.33	0.113	0.113	8.87	8.87	-38.0	-38.0	-26.3	57.2	48.6	17.6	0.20
960622	0700	0.33	0.113	0.113	8.87	8.87	-38.0	-42.0	-30.7	54.9	44.6	25.5	0.29
960622	1000	0.32	0.113	0.113	8.87	8.87	-38.0	-40.0	-36.5	52.2	39.7	30.7	0.32
960622	1300	0.30	0.113	0.113	8.87	8.87	-36.0	-42.0	-31.0	44.0	34.3	24.8	0.30
960622	1600	0.32	0.123	0.113	8.16	8.87	-38.0	-40.0	-35.6	35.1	27.2	26.4	0.29
960622	1900	0.34	0.162	0.113	6.19	8.87	-42.0	-42.0	-54.1	37.8	30.4	22.1	0.30
960622	2200	0.35	0.162	0.269	6.19	3.72	-46.0	-44.0	-52.0	34.9	21.5	16.9	0.26

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{JDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	x
960623	0100	0.32	0.171	0.113	5.83	8.87	-52.0	-52.0	-46.6	32.4	18.7	28.5	0.25
960623	0400	0.28	0.171	0.113	5.83	8.87	-48.0	-44.0	-41.5	34.6	25.2	24.8	0.29
960623	0700	0.30	0.162	0.113	6.19	8.87	-44.0	-44.0	-36.5	36.8	26.6	31.5	0.28
960623	1000	0.38	0.093	0.103	10.72	9.71	10.0	-44.0	-19.3	54.0	30.4	28.1	0.25
960623	1300	0.60	0.103	0.103	9.71	9.71	12.0	12.0	12.7	23.9	22.4	14.3	0.19
960623	1600	0.57	0.103	0.103	9.71	9.71	10.0	10.0	10.6	30.9	26.3	22.0	0.23
960623	1900	0.56	0.103	0.103	9.71	9.71	14.0	12.0	12.1	29.0	29.8	17.6	0.17
960623	2200	0.53	0.103	0.103	9.71	9.71	6.0	10.0	6.4	31.9	27.8	21.8	0.18
960624	0100	0.60	0.103	0.103	9.71	9.71	-2.0	0.0	10.8	36.2	29.9	21.6	0.18
960624	0400	0.71	0.103	0.103	9.71	9.71	-8.0	-6.0	9.3	34.5	18.7	15.7	0.14
960624	0700	0.67	0.113	0.103	8.87	9.71	-2.0	4.0	11.4	32.1	28.3	22.0	0.12
960624	1000	0.60	0.103	0.103	9.71	9.71	-2.0	6.0	1.1	37.6	35.9	22.5	0.15
960624	1300	0.64	0.318	0.103	3.15	9.71	-60.0	-58.0	-26.3	56.0	29.7	20.3	0.16
960624	1600	0.55	0.103	0.103	9.71	9.71	-2.0	-60.0	-25.7	55.9	21.9	17.2	0.20
960624	1900	0.47	0.113	0.113	8.87	8.87	-4.0	-4.0	-18.1	42.8	26.6	22.8	0.19
960625	1000	0.36	0.123	0.113	8.16	8.87	-32.0	-32.0	-30.9	34.1	27.2	26.6	0.24
960625	1300	0.32	0.113	0.113	8.87	8.87	-36.0	-34.0	-29.6	36.7	33.0	30.1	0.27
960625	1600	0.33	0.113	0.113	8.87	8.87	-36.0	-4.0	-25.4	37.2	35.5	35.0	0.23
960625	1900	0.34	0.113	0.113	8.87	8.87	-38.0	-6.0	-19.0	36.4	35.4	34.5	0.24
960625	2200	0.35	0.103	0.123	9.71	8.16	-32.0	-6.0	-22.4	37.4	36.1	37.5	0.25
960626	0100	1.00	0.220	0.220	4.54	4.54	52.0	54.0	47.2	27.7	23.9	15.0	0.31
960626	0400	1.75	0.162	0.181	6.19	5.52	36.0	36.0	36.5	27.1	26.8	26.4	0.18
960626	0700	1.73	0.162	0.162	6.19	6.19	26.0	26.0	31.3	22.0	22.1	16.1	0.14
960626	1000	1.50	0.152	0.152	6.59	6.59	28.0	36.0	30.8	22.5	23.0	12.8	0.12
960626	1300	1.33	0.152	0.152	6.59	6.59	32.0	32.0	29.7	23.2	23.5	10.6	0.19
960626	1600	1.00	0.152	0.152	6.59	6.59	30.0	30.0	23.8	26.8	26.1	18.4	0.12
960626	1900	0.84	0.162	0.162	6.19	6.19	30.0	30.0	24.6	33.3	27.5	13.1	0.08
960626	2200	0.79	0.171	0.171	5.83	5.83	28.0	28.0	19.6	37.6	27.3	16.4	0.08
960627	0100	0.75	0.181	0.171	5.52	5.83	34.0	12.0	21.0	38.4	31.6	26.4	0.10
960627	0400	0.67	0.181	0.113	5.52	8.87	32.0	34.0	18.6	40.2	31.2	33.3	0.11
960627	0700	0.59	0.191	0.113	5.24	8.87	34.0	32.0	13.5	40.7	29.3	32.4	0.10
960627	1000	0.57	0.113	0.103	8.87	9.71	-2.0	0.0	12.1	37.2	28.8	34.9	0.11
960627	1300	0.56	0.113	0.113	8.87	8.87	0.0	0.0	9.0	34.8	30.0	23.7	0.15
960627	1600	0.55	0.103	0.103	9.71	9.71	-2.0	0.0	0.3	30.8	31.3	26.7	0.21
960627	1900	0.54	0.103	0.103	9.71	9.71	0.0	0.0	-4.8	30.4	30.8	25.0	0.13
960627	2200	0.55	0.113	0.113	8.87	8.87	-4.0	-4.0	-6.1	25.7	24.7	18.7	0.11
960628	0100	0.53	0.113	0.113	8.87	8.87	-4.0	-4.0	-5.4	26.4	27.1	16.2	0.13
960628	0400	0.50	0.113	0.113	8.87	8.87	-4.0	-4.0	7.2	37.1	40.6	24.1	0.14
960628	0700	0.45	0.103	0.103	9.71	9.71	-2.0	-2.0	1.2	39.8	36.2	26.0	0.13
960628	1000	0.42	0.113	0.113	8.87	8.87	-28.0	-6.0	-6.5	38.0	33.7	26.6	0.12
960628	1300	0.41	0.103	0.103	9.71	9.71	-4.0	-6.0	-6.8	36.1	32.4	29.9	0.16
960628	1600	0.39	0.113	0.113	8.87	8.87	-4.0	-8.0	-11.6	37.9	33.8	34.3	0.22
960628	1900	0.35	0.113	0.113	8.87	8.87	-6.0	-8.0	-10.1	37.4	34.1	31.1	0.22
960628	2200	0.73	0.318	0.240	3.15	4.17	10.0	32.0	20.7	34.0	27.8	22.4	0.13
960629	0100	0.96	0.191	0.191	5.24	5.24	30.0	32.0	25.1	31.8	28.8	21.8	0.12
960629	0400	1.03	0.181	0.191	5.52	5.24	32.0	34.0	29.0	29.7	27.9	25.1	0.14
960629	0700	0.93	0.181	0.181	5.52	5.52	32.0	16.0	21.5	25.6	24.9	24.3	0.12
960629	1000	0.99	0.162	0.162	6.19	6.19	28.0	16.0	22.5	23.9	22.6	16.5	0.11
960629	1300	0.96	0.162	0.162	6.19	6.19	16.0	14.0	18.3	26.1	23.5	15.4	0.10
960629	1600	1.04	0.162	0.162	6.19	6.19	12.0	12.0	17.3	22.6	22.8	9.0	0.10
960629	1900	1.13	0.132	0.123	7.56	8.16	14.0	14.0	13.0	18.1	19.3	18.4	0.08
960629	2200	1.06	0.113	0.113	8.87	8.87	12.0	12.0	12.7	18.1	18.8	14.8	0.07
960630	0100	1.00	0.142	0.123	7.04	8.16	10.0	10.0	8.9	19.9	20.5	17.5	0.07

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
960630	0400	1.00	0.113	0.113	8.87	8.87	10.0	10.0	8.7	20.5	20.7	17.0	0.09
960630	0700	1.04	0.113	0.113	8.87	8.87	8.0	8.0	5.7	25.5	23.3	25.0	0.11
960630	1000	1.15	0.103	0.103	9.71	9.71	-4.0	-2.0	1.9	24.6	23.8	17.5	0.08
960630	1300	1.09	0.103	0.103	9.71	9.71	-4.0	0.0	-0.7	21.9	22.7	17.8	0.09
960630	1600	1.05	0.113	0.113	8.87	8.87	2.0	2.0	-4.1	23.8	22.6	19.8	0.13
960630	1900	1.03	0.103	0.103	9.71	9.71	0.0	-50.0	-17.1	44.6	19.7	20.4	0.17
960630	2200	0.90	0.103	0.103	9.71	9.71	4.0	-52.0	-18.3	48.7	18.0	24.8	0.12
960701	0100	0.78	0.103	0.113	9.71	8.87	0.0	0.0	-14.5	31.8	20.0	23.4	0.11
960701	0400	0.81	0.113	0.113	8.87	8.87	0.0	-2.0	-7.3	22.5	21.7	20.9	0.11
960701	0700	0.78	0.113	0.113	8.87	8.87	0.0	0.0	-1.9	21.8	22.6	19.3	0.12
960701	1000	0.81	0.113	0.113	8.87	8.87	2.0	2.0	9.8	26.4	24.3	17.7	0.09
960701	1300	0.99	0.132	0.123	7.56	8.16	4.0	4.0	28.4	58.7	23.3	20.6	0.12
960701	1600	1.02	0.113	0.240	8.87	4.17	-2.0	-2.0	27.3	64.5	30.9	24.7	0.25
960701	1900	0.83	0.103	0.113	9.71	8.87	0.0	0.0	25.1	62.4	36.8	21.4	0.27
960701	2200	0.74	0.113	0.113	8.87	8.87	-2.0	-2.0	-0.5	42.9	34.4	21.7	0.12
960702	0100	0.72	0.113	0.113	8.87	8.87	-2.0	-2.0	-4.7	33.9	32.9	19.4	0.08
960702	0400	0.78	0.113	0.123	8.87	8.16	2.0	2.0	-7.7	33.5	32.8	25.5	0.10
960702	0700	0.77	0.113	0.113	8.87	8.87	2.0	4.0	1.7	32.6	34.1	21.9	0.13
960702	1000	0.69	0.113	0.113	8.87	8.87	4.0	4.0	-2.0	33.7	35.7	24.5	0.10
960702	1300	0.62	0.103	0.113	9.71	8.87	-4.0	0.0	-11.6	38.3	37.9	30.7	0.08
960702	1600	0.62	0.123	0.113	8.16	8.87	-4.0	-4.0	-17.4	36.2	34.9	28.4	0.12
960702	1900	0.61	0.103	0.103	9.71	9.71	-34.0	-34.0	-24.5	37.2	36.2	34.7	0.19
960702	2200	0.60	0.113	0.113	8.87	8.87	-6.0	-6.0	-14.0	31.4	31.7	25.6	0.14
960703	0100	0.60	0.123	0.123	8.16	8.16	-32.0	-32.0	-20.3	34.0	34.6	29.1	0.09
960703	0400	0.63	0.113	0.113	8.87	8.87	-30.0	-30.0	-21.7	32.6	33.9	31.4	0.11
960703	0700	0.69	0.113	0.113	8.87	8.87	-30.0	-32.0	-28.2	32.5	34.1	26.1	0.15
960703	1000	0.68	0.113	0.113	8.87	8.87	-10.0	-10.0	-26.6	32.5	30.6	26.2	0.14
960703	1300	0.64	0.113	0.113	8.87	8.87	-12.0	-10.0	-19.5	27.9	27.3	21.6	0.10
960703	1600	0.65	0.123	0.113	8.16	8.87	-30.0	-30.0	-24.1	29.4	29.3	31.0	0.12
960703	1900	0.67	0.123	0.113	8.16	8.87	-28.0	-30.0	-18.1	31.7	33.3	27.7	0.16
960703	2200	0.57	0.113	0.113	8.87	8.87	-4.0	-4.0	-7.4	34.5	34.1	30.5	0.17
960704	0100	0.65	0.318	0.113	3.15	8.87	56.0	54.0	25.6	62.9	18.7	26.9	0.13
960704	0400	0.68	0.210	0.113	4.75	8.87	48.0	48.0	21.7	54.7	17.7	29.9	0.12
960704	0700	0.61	0.201	0.123	4.98	8.16	50.0	50.0	16.4	63.2	19.8	30.1	0.15
960704	1000	0.51	0.201	0.113	4.98	8.87	46.0	48.0	11.7	63.5	21.2	28.8	0.19
960704	1300	0.41	0.113	0.123	8.87	8.16	-34.0	-34.0	-7.9	41.9	28.3	27.7	0.15
960704	1600	0.43	0.123	0.123	8.16	8.16	-8.0	-10.0	-10.3	32.4	29.5	26.4	0.12
960704	1900	0.47	0.113	0.113	8.87	8.87	-26.0	-26.0	-17.1	34.9	28.8	22.5	0.16
960704	2200	0.45	0.123	0.113	8.16	8.87	-28.0	-34.0	-16.9	36.9	27.2	28.6	0.21
960705	0100	0.41	0.113	0.113	8.87	8.87	-32.0	-30.0	-22.4	36.9	29.6	27.9	0.17
960705	0400	0.43	0.113	0.113	8.87	8.87	-8.0	-32.0	-18.8	31.0	27.5	25.2	0.11
960705	0700	0.46	0.123	0.123	8.16	8.16	-30.0	-30.0	-23.3	28.6	24.7	19.6	0.17
960705	1000	0.45	0.123	0.123	8.16	8.16	-8.0	-32.0	-14.2	34.6	27.0	24.7	0.20
960705	1300	0.44	0.142	0.113	7.04	8.87	-40.0	-14.0	-14.3	36.9	27.1	28.6	0.19
960705	1600	0.43	0.142	0.113	7.04	8.87	-38.0	-38.0	-18.4	34.1	24.2	25.8	0.11
960705	1900	0.44	0.123	0.113	8.16	8.87	-18.0	-42.0	-19.8	38.1	23.1	27.7	0.17
960705	2200	0.47	0.113	0.113	8.87	8.87	-6.0	-46.0	-33.2	44.0	23.5	28.0	0.20
960706	0100	0.41	0.113	0.113	8.87	8.87	-30.0	-46.0	-28.2	38.4	21.0	24.5	0.23
960706	0400	0.39	0.123	0.123	8.16	8.16	-32.0	-34.0	-22.3	35.9	24.9	23.2	0.11
960706	0700	0.40	0.123	0.123	8.16	8.16	-26.0	-20.0	-20.8	34.6	26.2	23.8	0.16
960706	1000	0.45	0.123	0.123	8.16	8.16	-16.0	-58.0	-31.4	40.7	23.0	20.4	0.18
960706	1300	0.45	0.152	0.123	6.59	8.16	-44.0	-46.0	-27.8	39.9	25.0	25.7	0.21
960706	1600	0.46	0.123	0.123	8.16	8.16	-10.0	-52.0	-31.3	36.8	18.5	22.8	0.14
960706	1900	0.49	0.171	0.113	5.83	8.87	-44.0	-50.0	-31.1	33.2	19.3	26.8	0.14

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Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
960706	2200	0.67	0.171	0.181	5.83	5.52	-48.0	-48.0	-39.3	24.7	20.9	17.4	0.17
960707	0100	0.58	0.191	0.181	5.24	5.52	-50.0	-50.0	-37.3	32.9	24.3	23.2	0.16
960707	0400	0.48	0.123	0.113	8.16	8.87	-34.0	-48.0	-36.8	34.7	29.1	30.2	0.11
960707	0700	0.48	0.123	0.123	8.16	8.16	-36.0	-36.0	-33.5	31.1	29.8	28.1	0.11
960707	1000	0.48	0.113	0.113	8.87	8.87	-34.0	-14.0	-21.8	32.2	31.6	30.8	0.18
960707	1300	0.44	0.113	0.113	8.87	8.87	-30.0	-16.0	-25.0	30.4	29.2	35.0	0.17
960707	1600	0.44	0.318	0.113	3.15	8.87	-52.0	-52.0	-24.6	33.2	22.4	25.1	0.14
960707	1900	0.40	0.123	0.113	8.16	8.87	-26.0	-30.0	-32.9	32.3	23.7	31.1	0.13
960707	2200	0.38	0.123	0.123	8.16	8.16	-30.0	-30.0	-24.9	30.5	26.1	27.0	0.16
960708	0100	0.35	0.123	0.113	8.16	8.87	-4.0	-4.0	-12.8	31.9	30.5	30.5	0.20
960708	0400	0.33	0.123	0.113	8.16	8.87	-10.0	-10.0	-12.3	27.1	26.8	26.7	0.18
960708	0700	0.32	0.113	0.113	8.87	8.87	-4.0	-8.0	-10.7	26.7	25.6	22.9	0.17
960708	1000	0.31	0.113	0.113	8.87	8.87	-4.0	-6.0	-13.7	30.4	28.2	26.3	0.21
960708	1300	0.32	0.123	0.113	8.16	8.87	-14.0	-34.0	-22.8	31.4	27.0	34.0	0.20
960708	1600	0.29	0.123	0.123	8.16	8.16	-4.0	-28.0	-22.8	34.5	25.9	25.1	0.23
960708	1900	0.26	0.123	0.123	8.16	8.16	-28.0	-8.0	-19.2	33.7	27.1	26.1	0.18
960708	2200	0.28	0.123	0.123	8.16	8.16	-34.0	-56.0	-29.0	39.6	23.6	33.2	0.25
960709	0100	0.31	0.123	0.123	8.16	8.16	-4.0	-62.0	-35.2	48.1	23.0	25.8	0.24
960709	0400	0.30	0.181	0.123	5.52	8.16	-52.0	-52.0	-35.8	43.8	23.2	27.5	0.25
960709	0700	0.28	0.191	0.123	5.24	8.16	-50.0	-50.0	-35.6	37.7	20.5	31.6	0.21
960709	1000	0.33	0.054	0.054	18.45	18.45	-28.0	-50.0	-35.8	30.8	18.5	9.3	0.30
960709	1300	0.41	0.054	0.054	18.45	18.45	-30.0	-50.0	-36.4	24.7	14.8	11.2	0.36
960709	1600	0.48	0.054	0.054	18.45	18.45	-38.0	-52.0	-38.7	26.4	15.7	15.1	0.37
960709	1900	0.58	0.064	0.064	15.63	15.63	-30.0	-30.0	-36.3	19.7	11.8	9.5	0.25
960709	2200	0.63	0.064	0.064	15.63	15.63	-28.0	-28.0	-33.3	15.4	9.3	6.7	0.22
960710	0100	0.78	0.064	0.064	15.63	15.63	-30.0	-30.0	-31.8	13.6	10.9	6.6	0.24
960710	0400	0.87	0.064	0.064	15.63	15.63	-32.0	-32.0	-35.8	12.4	11.7	8.1	0.20
960710	0700	0.94	0.074	0.074	13.56	13.56	-24.0	-34.0	-29.9	14.2	13.2	12.2	0.18
960710	1000	1.00	0.074	0.074	13.56	13.56	-30.0	-32.0	-24.9	18.4	19.6	12.4	0.17
960710	1300	1.01	0.074	0.074	13.56	13.56	-32.0	-32.0	-21.2	25.8	29.5	13.6	0.32
960710	1600	1.03	0.074	0.074	13.56	13.56	-34.0	-34.0	-8.3	45.6	28.8	17.1	0.23
960710	1900	1.08	0.064	0.064	15.63	15.63	-32.0	-32.0	-16.4	23.0	20.2	7.1	0.19
960710	2200	1.18	0.074	0.083	13.56	11.98	-28.0	-28.0	-14.3	23.3	21.4	23.5	0.16
960711	0100	1.29	0.074	0.074	13.56	13.56	-30.0	-30.0	-19.4	19.4	17.2	6.8	0.18
960711	0400	1.30	0.074	0.074	13.56	13.56	-28.0	-30.0	-16.7	27.4	25.2	7.5	0.19
960711	0700	1.48	0.074	0.083	13.56	11.98	-32.0	-30.0	-28.0	22.9	25.6	25.6	0.12
960711	1000	1.54	0.083	0.083	11.98	11.98	-32.0	-28.0	-21.8	21.9	22.8	17.8	0.12
960711	1300	1.54	0.064	0.083	15.63	11.98	-28.0	-28.0	-25.2	22.6	22.2	24.6	0.14
960711	1600	1.51	0.064	0.064	15.63	15.63	-26.0	-26.0	-22.0	22.3	22.2	9.8	0.15
960711	1900	1.50	0.064	0.064	15.63	15.63	-26.0	-28.0	-20.9	20.5	21.0	7.2	0.14
960711	2200	1.52	0.074	0.074	13.56	13.56	-26.0	-26.0	-20.0	22.6	20.6	8.1	0.11
960712	0100	1.37	0.074	0.093	13.56	10.72	-28.0	-30.0	-22.1	24.6	23.6	20.0	0.12
960712	0400	1.24	0.074	0.093	13.56	10.72	-28.0	-28.0	-25.3	30.1	29.6	28.3	0.14
960712	0700	1.16	0.074	0.103	13.56	9.71	-24.0	-38.0	-28.9	33.5	33.4	26.0	0.11
960712	1000	1.23	0.142	0.103	7.04	9.71	-44.0	-42.0	-32.4	32.7	33.5	22.8	0.10
960712	1300	1.32	0.162	0.142	6.19	7.04	-44.0	-44.0	-42.6	27.6	28.0	19.7	0.12
960712	1600	2.11	0.113	0.113	8.87	8.87	-38.0	-44.0	-44.5	22.8	22.9	16.9	0.17
960712	1900	2.84	0.113	0.113	8.87	8.87	-36.0	-42.0	-40.8	21.1	20.9	14.4	0.23
960712	2200	2.64	0.093	0.093	10.72	10.72	-32.0	-28.0	-33.2	18.8	18.7	15.7	0.19
960713	0100	2.29	0.103	0.103	9.71	9.71	-30.0	-48.0	-38.8	23.2	17.4	17.8	0.24
960713	0400	1.42	0.093	0.093	10.72	10.72	-32.0	-34.0	-37.4	20.4	18.0	16.7	0.18
960713	0700	1.04	0.103	0.103	9.71	9.71	-34.0	-36.0	-36.6	22.0	17.8	21.7	0.16
960713	1000	0.87	0.103	0.103	9.71	9.71	-34.0	-38.0	-37.5	24.6	19.6	22.5	0.14

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Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
960713	1300	0.82	0.113	0.113	8.87	8.87	-34.0	-34.0	-36.0	21.3	18.8	16.7	0.14
960713	1600	0.84	0.113	0.113	8.87	8.87	-36.0	-36.0	-35.3	22.1	21.5	20.4	0.14
960713	1900	0.87	0.132	0.123	7.56	8.16	-38.0	-40.0	-40.1	23.1	22.8	20.7	0.12
960713	2200	0.78	0.123	0.123	8.16	8.16	-18.0	-40.0	-32.0	24.2	23.4	19.5	0.11
960714	0100	0.76	0.132	0.123	7.56	8.16	-38.0	-40.0	-36.9	23.4	21.8	20.9	0.12
960714	0400	0.70	0.162	0.123	6.19	8.16	-40.0	-40.0	-40.7	22.5	20.5	21.0	0.14
960714	0700	0.58	0.123	0.123	8.16	8.16	-34.0	-38.0	-40.3	24.4	19.8	13.4	0.14
960714	1000	0.52	0.123	0.123	8.16	8.16	-38.0	-38.0	-39.3	29.9	25.5	29.5	0.13
960714	1300	0.57	0.132	0.132	7.56	7.56	-40.0	-40.0	-36.4	28.7	22.8	23.2	0.11
960714	1600	0.72	0.142	0.132	7.04	7.56	-44.0	-44.0	-40.6	27.6	20.2	19.8	0.16
960714	1900	0.70	0.152	0.142	6.59	7.04	-44.0	-44.0	-43.6	27.9	22.8	21.8	0.15
960714	2200	0.60	0.162	0.132	6.19	7.56	-42.0	-50.0	-41.4	28.5	19.9	24.9	0.12
960715	0100	0.54	0.123	0.142	8.16	7.04	-34.0	-36.0	-41.3	26.2	19.7	21.3	0.11
960715	0400	0.57	0.142	0.142	7.04	7.04	-42.0	-44.0	-41.8	21.7	17.6	15.8	0.13
960715	0700	0.59	0.152	0.142	6.59	7.04	-46.0	-46.0	-44.1	21.8	17.5	18.3	0.15
960715	1000	0.57	0.152	0.142	6.59	7.04	-44.0	-44.0	-44.0	23.5	17.2	20.4	0.12
960715	1300	0.63	0.152	0.132	6.59	7.56	-42.0	-56.0	-45.2	25.8	15.0	18.8	0.12
960715	1600	0.68	0.152	0.152	6.59	6.59	-42.0	-54.0	-46.5	20.2	13.2	16.2	0.15
960715	1900	0.60	0.152	0.152	6.59	6.59	-40.0	-48.0	-44.5	20.7	13.8	11.2	0.17
960715	2200	0.54	0.152	0.132	6.59	7.56	-40.0	-40.0	-44.0	22.7	13.5	17.3	0.14
960716	0100	0.49	0.162	0.142	6.19	7.04	-44.0	-38.0	-42.3	25.1	15.5	16.8	0.11
960716	0400	0.49	0.162	0.132	6.19	7.56	-42.0	-40.0	-42.6	24.3	16.3	15.6	0.14
960716	0700	0.49	0.123	0.113	8.16	8.87	-34.0	-36.0	-43.0	28.4	17.9	20.3	0.14
960716	1000	0.49	0.103	0.113	9.71	8.87	-32.0	-34.0	-43.1	27.6	18.7	18.6	0.13
960716	1300	0.50	0.123	0.123	8.16	8.16	-32.0	-34.0	-38.3	20.3	20.7	13.3	0.12
960716	1600	0.53	0.123	0.123	8.16	8.16	-32.0	-36.0	-37.7	19.2	19.9	13.7	0.14
960716	1900	0.51	0.113	0.113	8.87	8.87	-32.0	-32.0	-38.2	22.5	19.5	16.3	0.19
960716	2200	0.47	0.103	0.113	9.71	8.87	-32.0	-32.0	-41.3	26.1	21.8	24.2	0.15
960717	0100	0.45	0.113	0.113	8.87	8.87	-32.0	-34.0	-36.7	25.0	21.4	17.4	0.13
960717	0400	0.46	0.123	0.123	8.16	8.16	-32.0	-34.0	-37.5	25.4	23.2	17.0	0.14
960717	0700	0.50	0.123	0.113	8.16	8.87	-34.0	-36.0	-38.9	27.0	26.6	27.4	0.19
960717	1000	0.47	0.113	0.113	8.87	8.87	-18.0	-20.0	-29.7	25.3	25.4	22.6	0.17
960717	1300	0.44	0.113	0.113	8.87	8.87	-36.0	-36.0	-33.7	23.0	24.1	23.0	0.14
960717	1600	0.47	0.103	0.113	9.71	8.87	-36.0	-36.0	-37.1	22.3	21.0	19.6	0.17
960717	1900	0.48	0.113	0.113	8.87	8.87	-40.0	-38.0	-41.2	27.5	24.9	24.0	0.18
960717	2200	0.46	0.113	0.113	8.87	8.87	-36.0	-36.0	-39.3	27.9	25.5	20.9	0.17
960718	0100	0.45	0.113	0.113	8.87	8.87	-36.0	-36.0	-33.2	25.7	26.0	24.7	0.13
960718	0400	0.46	0.113	0.113	8.87	8.87	-14.0	-16.0	-26.5	26.7	26.2	22.5	0.16
960718	1000	0.43	0.113	0.113	8.87	8.87	-34.0	-36.0	-36.3	24.6	21.7	18.1	0.18
960718	1300	0.38	0.123	0.113	8.16	8.87	-36.0	-36.0	-35.5	26.1	23.6	26.9	0.17
960718	1600	0.38	0.123	0.113	8.16	8.87	-34.0	-34.0	-34.2	25.5	22.8	23.0	0.16
960718	1900	0.44	0.113	0.113	8.87	8.87	-38.0	-38.0	-11.5	64.2	27.8	26.5	0.21
960718	2200	0.51	0.113	0.113	8.87	8.87	-36.0	52.0	10.5	76.4	26.7	21.2	0.16
960719	0100	0.36	0.123	0.113	8.16	8.87	-34.0	-38.0	-36.1	27.3	26.2	25.1	0.16
960719	0400	0.39	0.113	0.113	8.87	8.87	-34.0	-34.0	-36.6	20.4	16.7	14.4	0.19
960719	0700	0.36	0.123	0.113	8.16	8.87	-36.0	-36.0	-36.4	22.3	17.1	15.9	0.20
960719	1000	0.34	0.113	0.113	8.87	8.87	-36.0	-38.0	-39.1	27.1	19.3	24.6	0.19
960719	1300	0.31	0.132	0.123	7.56	8.16	-42.0	-40.0	-37.6	30.3	21.1	19.2	0.23
960719	1600	0.32	0.113	0.123	8.87	8.16	-36.0	-36.0	-33.9	28.4	23.0	25.6	0.20
960719	1900	0.37	0.123	0.123	8.16	8.16	-36.0	-38.0	-37.3	26.6	22.5	21.8	0.22
960719	2200	0.39	0.142	0.142	7.04	7.04	-42.0	-40.0	-41.2	21.6	18.1	12.2	0.21
960720	0100	0.37	0.142	0.142	7.04	7.04	-40.0	-40.0	-40.3	19.1	15.2	6.3	0.19
960720	0400	0.35	0.142	0.132	7.04	7.56	-44.0	-44.0	-28.2	33.7	23.7	12.9	0.19

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Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
960720	0700	0.47	0.132	0.279	7.56	3.59	-42.0	50.0	14.5	84.1	23.1	14.1	0.18
960720	1000	0.49	0.132	0.230	7.56	4.35	-42.0	60.0	28.6	84.2	27.9	13.2	0.15
960720	1300	0.48	0.132	0.230	7.56	4.35	-40.0	42.0	29.4	70.7	26.7	18.0	0.12
960720	1600	0.46	0.220	0.220	4.54	4.54	46.0	40.0	23.0	66.1	27.2	19.8	0.12
960720	1900	0.46	0.132	0.201	7.56	4.98	-40.0	40.0	13.9	67.9	27.1	16.9	0.15
960720	2200	0.44	0.181	0.210	5.52	4.75	32.0	32.0	18.0	74.0	36.5	28.3	0.16
960721	0100	0.47	0.181	0.181	5.52	5.52	42.0	44.0	18.7	68.5	32.3	13.9	0.16
960721	0400	0.44	0.201	0.171	4.98	5.83	38.0	36.0	11.3	61.3	31.5	24.9	0.14
960721	0700	0.48	0.181	0.191	5.52	5.24	18.0	16.0	10.4	51.6	28.9	21.1	0.16
960721	1000	0.48	0.201	0.210	4.98	4.75	18.0	18.0	6.7	51.9	29.4	19.5	0.15
960721	1300	0.44	0.074	0.074	13.56	13.56	-16.0	42.0	13.4	61.4	30.5	17.2	0.19
960721	1600	0.37	0.074	0.074	13.56	13.56	-22.0	38.0	4.6	66.3	37.4	22.0	0.19
960721	1900	0.33	0.132	0.074	7.56	13.56	-38.0	-38.0	-2.3	59.5	36.9	22.8	0.20
960721	2200	0.35	0.142	0.083	7.04	11.98	-40.0	-38.0	-16.0	40.9	36.1	28.1	0.19
960722	0100	0.34	0.074	0.074	13.56	13.56	-20.0	-16.0	-22.8	39.0	41.5	25.8	0.22
960722	0400	0.34	0.074	0.074	13.56	13.56	-18.0	-16.0	-4.8	43.2	43.0	26.3	0.16
960722	0700	0.33	0.083	0.083	11.98	11.98	0.0	-10.0	-14.7	41.1	46.5	31.4	0.20
960722	1000	0.33	0.132	0.083	7.56	11.98	-38.0	-38.0	-40.5	43.3	36.4	31.4	0.18
960722	1600	0.61	0.181	0.181	5.52	5.52	-50.0	-50.0	-47.8	20.7	18.1	14.1	0.13
960722	1900	0.63	0.162	0.171	6.19	5.83	-34.0	-34.0	-39.6	17.9	17.6	12.6	0.15
960722	2200	0.59	0.171	0.171	5.83	5.83	-48.0	-36.0	-39.5	21.0	19.7	16.0	0.15
960723	0100	0.56	0.181	0.171	5.52	5.83	-50.0	-40.0	-41.4	25.0	21.7	21.4	0.14
960723	0400	0.55	0.181	0.181	5.52	5.52	-48.0	-36.0	-38.8	29.2	23.4	17.0	0.12
960723	1300	0.41	0.142	0.132	7.04	7.56	-38.0	-32.0	-19.4	44.4	36.7	25.4	0.15
960723	1600	0.43	0.142	0.142	7.04	7.04	-42.0	68.0	-2.2	70.7	33.6	22.6	0.15
960723	1900	0.41	0.142	0.142	7.04	7.04	-44.0	-6.0	-17.5	38.3	37.8	30.1	0.14
960723	2200	0.44	0.132	0.132	7.56	7.56	-42.0	-42.0	-16.9	43.0	40.2	20.4	0.16
960724	0100	0.44	0.152	0.132	6.59	7.56	-46.0	-46.0	-36.2	43.8	39.7	27.6	0.17
960724	0400	0.37	0.152	0.132	6.59	7.56	-48.0	-46.0	-51.3	47.3	43.0	24.8	0.18
960724	0700	0.35	0.152	0.152	6.59	6.59	-48.0	-48.0	-47.5	47.8	41.0	29.5	0.19
960724	1000	0.38	0.152	0.152	6.59	6.59	-50.0	-52.0	-25.2	56.9	50.5	33.6	0.22
960724	1300	0.41	0.142	0.230	7.04	4.35	-46.0	-48.0	-13.4	69.8	53.3	48.5	0.17
960724	1600	0.42	0.142	0.142	7.04	7.04	-44.0	-44.0	-17.6	57.6	44.6	14.0	0.17
960724	1900	0.51	0.142	0.289	7.04	3.47	-42.0	-6.0	-23.4	52.5	36.4	52.7	0.15
960724	2200	0.52	0.152	0.259	6.59	3.86	-44.0	-42.0	-22.8	45.6	35.1	26.5	0.18
960725	0100	0.53	0.142	0.230	7.04	4.35	-44.0	-44.0	-25.6	44.9	32.1	23.5	0.16
960725	0400	0.49	0.152	0.220	6.59	4.54	-48.0	-50.0	-28.5	48.9	34.4	27.7	0.16
960725	0700	0.45	0.152	0.230	6.59	4.35	-48.0	-8.0	-26.2	44.3	32.5	20.4	0.14
960726	0700	0.32	0.152	0.123	6.59	8.16	-48.0	-46.0	-38.2	38.4	29.3	25.5	0.22
960726	1000	0.34	0.132	0.123	7.56	8.16	-38.0	-36.0	-32.0	35.0	27.7	17.1	0.21
960726	1300	0.36	0.132	0.123	7.56	8.16	-40.0	-42.0	-35.3	37.2	32.6	34.8	0.20
960726	1600	0.35	0.123	0.123	8.16	8.16	-38.0	-40.0	-24.2	50.2	37.1	23.8	0.20
960726	1900	0.32	0.132	0.132	7.56	7.56	-40.0	-40.0	-36.4	45.2	42.9	27.1	0.25
960726	2200	0.33	0.123	0.123	8.16	8.16	-38.0	-38.0	-24.5	47.0	50.9	30.4	0.21
960727	0100	0.33	0.123	0.103	8.16	9.71	-36.0	-36.0	-26.4	44.7	49.2	30.7	0.22
960727	0400	0.34	0.103	0.103	9.71	9.71	-28.0	-38.0	-7.9	54.6	38.8	16.4	0.19
960727	0700	0.35	0.103	0.103	9.71	9.71	-40.0	-38.0	-8.1	56.3	31.2	17.8	0.26
960727	1000	0.37	0.113	0.103	8.87	9.71	-38.0	-38.0	-9.1	51.3	30.4	14.1	0.21
960727	1300	0.40	0.113	0.113	8.87	8.87	-40.0	-38.0	-8.1	52.8	37.2	17.7	0.19
960727	1600	0.40	0.103	0.113	9.71	8.87	-40.0	-38.0	-8.8	55.9	37.2	33.7	0.20
960727	1900	0.39	0.103	0.103	9.71	9.71	-38.0	-36.0	-13.2	49.0	38.6	20.1	0.25
960727	2200	0.40	0.113	0.103	8.87	9.71	-36.0	-36.0	-24.3	44.0	39.8	24.1	0.20

Appendix A Table of Collection Times and Bulk Parameters

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	x
960728	0100	0.41	0.113	0.103	8.87	9.71	-36.0	-36.0	-20.4	44.7	28.6	18.5	0.22
960728	0400	0.43	0.103	0.103	9.71	9.71	-36.0	-38.0	-19.1	46.0	28.8	13.9	0.20
960728	0700	0.48	0.103	0.103	9.71	9.71	-38.0	-38.0	-40.1	37.8	34.9	17.3	0.23
960728	1000	0.52	0.103	0.103	9.71	9.71	-38.0	-36.0	-48.9	40.6	26.7	15.1	0.15
960728	1300	0.53	0.113	0.113	8.87	8.87	-36.0	-36.0	-44.6	33.9	23.4	14.4	0.20
960728	1600	0.56	0.113	0.103	8.87	9.71	-38.0	-38.0	-48.7	36.3	22.9	18.0	0.21
960728	1900	0.64	0.103	0.103	9.71	9.71	-38.0	-36.0	-41.9	28.3	29.8	15.6	0.20
960728	2200	0.71	0.269	0.279	3.72	3.59	-56.0	-56.0	-47.1	32.5	28.0	28.2	0.19
960729	0100	0.72	0.240	0.240	4.17	4.17	-52.0	-52.0	-46.9	27.9	22.8	14.7	0.21
960729	0400	0.65	0.220	0.113	4.54	8.87	-52.0	-54.0	-48.6	28.4	20.3	12.3	0.18
960729	0700	0.45	0.113	0.113	8.87	8.87	-38.0	-36.0	-28.2	33.5	36.2	16.4	0.25
960729	1000	0.42	0.113	0.113	8.87	8.87	-36.0	-36.0	-21.1	30.9	28.7	20.2	0.18
960729	1300	0.50	0.308	0.113	3.25	8.87	54.0	-24.0	0.7	60.3	28.4	28.5	0.19
960729	1600	0.57	0.210	0.113	4.75	8.87	38.0	40.0	14.8	62.0	33.8	26.0	0.15
960729	1900	0.54	0.113	0.113	8.87	8.87	-36.0	38.0	15.0	57.0	33.4	28.6	0.16
960729	2200	0.50	0.103	0.210	9.71	4.75	-24.0	32.0	-4.4	59.2	44.0	49.9	0.16
960730	0100	0.53	0.210	0.210	4.75	4.75	30.0	26.0	6.9	56.1	43.8	24.1	0.16
960730	0400	0.67	0.201	0.201	4.98	4.98	16.0	16.0	7.6	38.6	27.1	14.3	0.12
960730	0700	0.64	0.171	0.181	5.83	5.52	8.0	12.0	2.5	32.9	31.0	11.3	0.14
960730	1000	0.56	0.181	0.181	5.52	5.52	8.0	12.0	2.6	33.0	27.1	11.3	0.14
960730	1300	0.50	0.181	0.181	5.52	5.52	14.0	12.0	-0.5	34.7	25.3	11.7	0.13
960730	1600	0.51	0.181	0.181	5.52	5.52	2.0	4.0	-19.5	46.4	38.0	10.2	0.16
960730	1900	0.51	0.181	0.171	5.52	5.83	-56.0	12.0	-35.0	59.6	52.5	62.7	0.18
960730	2200	0.49	0.152	0.152	6.59	6.59	10.0	10.0	-35.9	63.0	44.6	20.0	0.19
960731	0100	0.44	0.103	0.162	9.71	6.19	-32.0	6.0	-27.0	50.4	32.3	18.7	0.13
960731	0400	0.50	0.162	0.162	6.19	6.19	4.0	4.0	-15.3	42.8	24.6	13.4	0.18
960731	0700	0.45	0.152	0.152	6.59	6.59	12.0	12.0	-16.1	51.8	28.3	10.2	0.18
960731	1000	0.43	0.103	0.152	9.71	6.59	-34.0	12.0	-25.6	56.2	31.2	18.5	0.21
960731	1300	0.45	0.132	0.132	7.56	7.56	10.0	-54.0	-28.3	57.8	22.7	20.7	0.15
960731	1600	0.49	0.230	0.142	4.35	7.04	-56.0	-58.0	-32.5	56.7	23.4	20.9	0.20
960731	1900	0.48	0.220	0.142	4.54	7.04	-54.0	-54.0	-38.4	38.7	19.4	24.5	0.21
960731	2200	0.34	0.113	0.103	8.87	9.71	-36.0	-56.0	-34.1	49.1	25.4	33.6	0.29
960801	0100	0.29	0.113	0.113	8.87	8.87	-34.0	-34.0	-32.2	41.2	27.8	13.4	0.20
960801	0400	0.31	0.123	0.113	8.16	8.87	-36.0	-38.0	-23.9	43.5	35.6	31.1	0.30
960801	0700	0.33	0.132	0.123	7.56	8.16	-36.0	-38.0	-37.5	42.9	36.2	28.5	0.26
960801	1600	0.40	0.279	0.132	3.59	7.56	-56.0	-56.0	-40.7	40.3	21.6	41.1	0.26
960801	1900	0.32	0.162	0.132	6.19	7.56	-40.0	-38.0	-37.7	35.6	26.3	39.5	0.29
960801	2200	0.32	0.132	0.123	7.56	8.16	-40.0	-60.0	-43.4	43.4	24.7	42.1	0.25
960802	0100	0.31	0.162	0.103	6.19	9.71	-46.0	-46.0	-32.0	41.6	27.6	27.1	0.24
960802	0400	0.33	0.103	0.103	9.71	9.71	-32.0	-34.0	-34.6	38.9	34.0	23.1	0.25
960802	0700	0.37	0.103	0.103	9.71	9.71	-36.0	-52.0	-41.2	36.7	28.4	18.3	0.24
960802	1000	0.37	0.171	0.103	5.83	9.71	-50.0	-52.0	-43.8	34.6	26.1	30.5	0.24
960802	1300	0.33	0.181	0.064	5.52	15.63	-48.0	-50.0	-39.9	36.2	25.7	23.6	0.27
960802	1600	0.31	0.171	0.064	5.83	15.63	-46.0	-40.0	-36.9	38.8	29.7	25.3	0.28
960802	1900	0.31	0.181	0.064	5.52	15.63	-50.0	-50.0	-36.4	38.3	29.0	21.3	0.28
960802	2200	0.30	0.113	0.113	8.87	8.87	-34.0	-42.0	-40.2	36.5	28.8	22.4	0.25
960803	0100	0.33	0.162	0.064	6.19	15.63	-42.0	-42.0	-37.6	35.8	23.9	21.0	0.28
960803	0400	0.34	0.113	0.113	8.87	8.87	-36.0	-38.0	-38.8	35.4	25.2	16.8	0.19
960803	0700	0.39	0.201	0.201	4.98	4.98	-52.0	-52.0	-42.2	28.5	20.9	16.1	0.22
960803	1000	0.38	0.181	0.113	5.52	8.87	-50.0	-54.0	-42.1	34.7	25.7	17.2	0.19
960803	1300	0.39	0.123	0.123	8.16	8.16	-36.0	-36.0	-40.7	30.4	21.0	12.1	0.24
960803	1600	0.39	0.152	0.123	6.59	8.16	-44.0	-42.0	-42.6	34.4	30.9	28.7	0.23
960803	1900	0.43	0.132	0.132	7.56	7.56	-40.0	-40.0	-37.1	34.8	33.1	28.1	0.19
960803	2200	0.45	0.152	0.142	6.59	7.04	-46.0	-44.0	-37.9	39.7	33.7	21.1	0.19

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Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{JDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
960804	0100	0.46	0.152	0.152	6.59	6.59	-48.0	-42.0	-44.3	36.5	30.0	11.4	0.26
960804	0400	0.47	0.162	0.152	6.19	6.59	-42.0	-40.0	-38.9	28.0	25.2	12.6	0.17
960804	0700	0.47	0.152	0.142	6.59	7.04	-40.0	-40.0	-34.2	31.9	26.5	20.6	0.22
960804	1000	0.48	0.152	0.152	6.59	6.59	-42.0	-42.0	-30.6	33.3	28.5	11.2	0.24
960804	1300	0.50	0.142	0.142	7.04	7.04	-44.0	-42.0	-13.9	63.4	24.0	11.2	0.23
960804	1600	0.55	0.142	0.152	7.04	6.59	-42.0	44.0	-5.9	78.5	25.4	12.1	0.20
960804	1900	0.64	0.162	0.162	6.19	6.19	-46.0	42.0	5.6	73.3	25.6	13.1	0.18
960804	2200	0.65	0.230	0.240	4.35	4.17	44.0	44.0	5.7	71.4	29.1	24.0	0.14
960805	0100	0.51	0.162	0.240	6.19	4.17	-38.0	-38.0	0.6	66.6	28.5	19.5	0.17
960805	0400	0.47	0.152	0.132	6.59	7.56	-36.0	-36.0	-2.3	58.9	29.2	14.6	0.16
960805	0700	0.51	0.162	0.152	6.19	6.59	-42.0	-40.0	-5.8	54.5	24.3	10.3	0.20
960805	1000	0.61	0.162	0.289	6.19	3.47	-42.0	-40.0	1.6	56.5	27.1	31.6	0.17
960805	1300	0.64	0.123	0.269	8.16	3.72	-34.0	18.0	-1.7	51.4	27.7	23.8	0.17
960805	1600	0.59	0.132	0.123	7.56	8.16	-38.0	-38.0	-11.8	49.5	26.8	18.5	0.14
960805	1900	0.58	0.132	0.132	7.56	7.56	-34.0	-38.0	-18.8	43.6	26.9	11.8	0.15
960805	2200	0.56	0.132	0.132	7.56	7.56	-34.0	-38.0	-23.8	38.6	26.8	14.5	0.16
960806	0100	0.48	0.132	0.132	7.56	7.56	-40.0	-40.0	-20.1	40.2	30.6	21.2	0.17
960806	0400	0.46	0.132	0.132	7.56	7.56	-36.0	-36.0	-21.6	38.6	29.0	21.3	0.17
960806	0700	0.45	0.123	0.132	8.16	7.56	-34.0	-34.0	-22.5	34.3	27.2	22.9	0.18
960806	1000	0.46	0.142	0.142	7.04	7.04	-38.0	-36.0	-26.8	34.1	26.9	19.3	9.99
960806	1600	0.41	0.142	0.142	7.04	7.04	-36.0	-36.0	-26.9	35.3	32.0	26.6	0.20
960806	1900	0.42	0.142	0.142	7.04	7.04	-40.0	-38.0	-24.2	34.1	32.1	25.5	0.17
960806	2200	0.44	0.113	0.142	8.87	7.04	-34.0	-14.0	-22.5	30.7	31.9	26.6	0.17
960807	0100	0.44	0.132	0.132	7.56	7.56	-14.0	-14.0	-21.6	31.5	32.1	24.7	0.17
960807	0400	0.48	0.123	0.123	8.16	8.16	-12.0	-38.0	-22.9	30.0	28.6	24.2	0.17
960807	0700	0.51	0.113	0.132	8.87	7.56	-38.0	-10.0	-17.4	29.6	29.0	25.1	0.17
960807	1000	0.58	0.113	0.142	8.87	7.04	-38.0	-38.0	-22.3	30.2	28.5	24.0	0.19
960807	1300	0.59	0.123	0.123	8.16	8.16	-36.0	-36.0	-26.0	35.3	34.5	18.8	0.16
960807	1600	0.55	0.113	0.123	8.87	8.16	-40.0	-38.0	-19.5	37.1	33.8	21.5	0.14
960807	1900	0.54	0.123	0.123	8.16	8.16	-36.0	-36.0	-15.8	36.7	30.8	20.4	0.15
960807	2200	0.58	0.123	0.123	8.16	8.16	-38.0	-36.0	-16.5	36.0	28.7	21.0	0.15
960808	0100	0.62	0.123	0.123	8.16	8.16	-38.0	-36.0	-18.4	31.6	28.5	24.5	0.14
960808	0400	0.63	0.123	0.132	8.16	7.56	-36.0	-34.0	-18.7	27.6	26.1	22.6	0.15
960808	0700	0.64	0.123	0.132	8.16	7.56	-34.0	-34.0	-17.8	29.2	26.5	19.2	0.13
960808	1000	0.71	0.123	0.132	8.16	7.56	-34.0	-12.0	-16.8	27.9	25.5	20.6	0.17
960808	1300	0.73	0.113	0.132	8.87	7.56	-36.0	-12.0	-13.7	30.1	28.0	21.2	0.14
960808	1600	0.70	0.123	0.123	8.16	8.16	-30.0	-32.0	-21.1	27.9	28.2	22.8	0.14
960808	1900	0.68	0.123	0.123	8.16	8.16	-30.0	-32.0	-24.4	28.1	27.3	22.7	0.13
960808	2200	0.70	0.103	0.123	9.71	8.16	-36.0	-32.0	-20.7	26.9	23.9	20.1	0.12
960809	0100	0.71	0.123	0.123	8.16	8.16	-32.0	-34.0	-22.7	28.4	26.3	18.5	0.15
960809	0400	0.67	0.113	0.113	8.87	8.87	-34.0	-34.0	-22.3	28.8	28.4	20.6	0.16
960809	0700	0.63	0.113	0.103	8.87	9.71	-32.0	-32.0	-17.1	29.6	27.5	20.1	0.14
960809	1000	0.62	0.113	0.103	8.87	9.71	-34.0	-34.0	-20.6	29.7	26.2	23.1	0.17
960809	1300	0.62	0.113	0.103	8.87	9.71	-34.0	-34.0	-26.8	27.8	25.9	20.3	0.17
960809	1600	0.53	0.113	0.113	8.87	8.87	-36.0	-34.0	-32.9	27.1	24.7	18.1	0.21
960809	1900	0.53	0.113	0.113	8.87	8.87	-34.0	-34.0	-27.1	29.1	25.3	21.7	0.23
960809	2200	0.53	0.123	0.113	8.16	8.87	-32.0	-34.0	-21.7	28.1	25.3	19.6	0.19
960810	0100	0.52	0.103	0.103	9.71	9.71	-32.0	-34.0	-22.2	30.4	28.4	24.0	0.22
960810	0400	0.47	0.113	0.103	8.87	9.71	-36.0	-36.0	-21.0	32.7	31.6	27.8	0.25
960810	0700	0.44	0.103	0.103	9.71	9.71	-34.0	-34.0	-31.7	31.6	30.6	30.2	0.25
960810	1000	0.44	0.103	0.103	9.71	9.71	-10.0	-8.0	-25.1	30.8	29.4	25.6	0.25
960810	1300	0.45	0.113	0.113	8.87	8.87	-30.0	-32.0	-27.2	30.9	30.3	27.1	0.25
960810	1600	0.52	0.113	0.113	8.87	8.87	-36.0	-42.0	-9.6	49.1	32.5	30.8	0.23
960810	1900	0.61	0.152	0.113	6.59	8.87	-42.0	-38.0	1.3	93.1	25.1	29.3	0.21

(Sheet 50 of 54)

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	x
960810	2200	0.63	0.113	0.113	8.87	8.87	-32.0	-36.0	-3.9	78.1	23.4	21.7	0.22
960811	0100	0.70	0.269	0.113	3.72	8.87	60.0	-34.0	-0.4	81.1	25.1	26.0	0.22
960811	0400	0.62	0.123	0.113	8.16	8.87	-34.0	-38.0	-13.3	61.5	26.7	26.5	0.25
960811	0700	0.55	0.113	0.113	8.87	8.87	-34.0	-36.0	-25.1	39.0	26.3	26.9	0.31
960811	1000	0.55	0.093	0.093	10.72	10.72	-34.0	-36.0	-22.1	43.3	26.4	27.6	0.23
960811	1300	0.63	0.132	0.113	7.56	8.87	-38.0	-38.0	-13.9	57.7	26.1	31.5	0.25
960811	1600	0.65	0.113	0.093	8.87	10.72	-36.0	-36.0	1.2	64.7	26.1	24.5	0.24
960811	1900	0.67	0.220	0.113	4.54	8.87	42.0	42.0	6.2	66.7	25.3	25.7	0.21
960811	2200	0.70	0.181	0.113	5.52	8.87	44.0	44.0	11.4	64.1	23.8	20.9	0.17
960812	0100	0.69	0.181	0.113	5.52	8.87	38.0	-34.0	4.6	58.3	27.2	27.5	0.16
960812	0400	0.75	0.123	0.181	8.16	5.52	-34.0	-34.0	3.9	59.1	29.2	16.1	0.20
960812	0700	0.78	0.113	0.093	8.87	10.72	-32.0	-34.0	-6.9	57.4	34.7	30.2	0.15
960812	1000	0.79	0.113	0.093	8.87	10.72	-30.0	-34.0	-5.6	54.0	37.2	29.1	0.13
960812	1300	0.93	0.113	0.259	8.87	3.86	-32.0	-34.0	-18.5	50.7	42.4	41.5	0.14
960812	1600	0.91	0.123	0.123	8.16	8.16	-32.0	-32.0	-26.3	45.5	33.6	12.2	0.19
960812	1900	0.89	0.230	0.230	4.35	4.35	-54.0	-34.0	-39.2	45.1	34.7	26.6	0.16
960812	2200	0.91	0.201	0.201	4.98	4.98	-52.0	-34.0	-43.4	29.9	24.3	17.1	0.10
960813	0100	0.94	0.181	0.171	5.52	5.83	-44.0	-40.0	-42.2	30.6	24.5	24.4	0.10
960813	0400	0.89	0.191	0.171	5.24	5.83	-48.0	-34.0	-42.1	29.7	29.8	26.0	0.12
960813	0700	0.83	0.171	0.171	5.83	5.83	-46.0	-46.0	-42.5	32.7	29.7	20.8	0.12
960813	1000	0.82	0.152	0.152	6.59	6.59	-42.0	-42.0	-40.1	33.1	30.7	22.4	0.12
960813	1300	0.79	0.142	0.132	7.04	7.56	-40.0	-40.0	-36.0	34.3	35.6	21.8	0.12
960813	1600	0.81	0.132	0.132	7.56	7.56	-36.0	-44.0	-27.4	45.2	40.3	25.9	0.16
960813	1900	0.72	0.152	0.132	6.59	7.56	-44.0	-42.0	-13.6	62.1	36.8	27.6	0.22
960813	2200	0.66	0.298	0.132	3.35	7.56	56.0	54.0	7.5	76.3	30.4	28.9	0.21
960814	0100	1.31	0.171	0.152	5.83	6.59	38.0	48.0	36.9	18.7	16.3	14.5	0.19
960814	0400	1.29	0.162	0.152	6.19	6.59	36.0	34.0	34.1	21.5	19.9	15.7	0.18
960814	0700	1.21	0.142	0.142	7.04	7.04	26.0	36.0	33.7	23.5	20.7	14.7	0.19
960814	1000	1.04	0.142	0.132	7.04	7.56	28.0	30.0	31.9	23.5	21.2	22.0	0.11
960814	1600	0.92	0.142	0.142	7.04	7.04	22.0	34.0	27.6	32.3	28.3	19.0	0.09
960814	1900	0.84	0.142	0.142	7.04	7.04	32.0	34.0	25.6	36.4	30.4	24.3	0.12
960814	2200	0.71	0.152	0.142	6.59	7.04	30.0	24.0	20.6	44.6	33.2	33.3	0.09
960815	0100	0.68	0.162	0.152	6.19	6.59	30.0	32.0	20.8	42.7	32.1	24.7	0.08
960815	0400	0.63	0.171	0.162	5.83	6.19	14.0	14.0	12.1	42.6	31.9	22.7	0.09
960815	0700	0.60	0.171	0.171	5.83	5.83	12.0	12.0	12.8	43.7	30.3	22.6	0.14
960815	1000	0.58	0.171	0.171	5.83	5.83	14.0	12.0	10.0	39.7	29.1	15.2	0.11
960815	1300	0.54	0.181	0.181	5.52	5.52	12.0	12.0	5.4	42.5	32.6	17.0	0.10
960815	1600	0.52	0.191	0.191	5.24	5.24	8.0	8.0	3.6	47.1	34.0	34.2	0.11
960815	1900	0.47	0.250	0.103	4.01	9.71	10.0	10.0	0.2	49.4	36.7	27.3	0.14
960815	2200	0.41	0.113	0.103	8.87	9.71	-36.0	10.0	1.0	45.5	33.0	29.8	0.14
960816	0100	0.40	0.113	0.103	8.87	9.71	-32.0	18.0	-5.3	48.4	34.0	31.4	0.13
960816	0400	0.41	0.123	0.103	8.16	9.71	-34.0	16.0	-10.7	53.9	34.6	31.4	0.14
960816	0700	0.41	0.181	0.103	5.52	9.71	-48.0	24.0	-7.2	57.4	40.1	28.3	0.16
960816	1000	0.39	0.103	0.103	9.71	9.71	-32.0	12.0	-8.6	50.1	37.5	25.6	0.30
960816	1300	0.37	0.210	0.210	4.75	4.75	8.0	6.0	-7.5	48.4	36.9	21.5	0.17
960816	1600	0.37	0.210	0.191	4.75	5.24	10.0	8.0	-18.4	50.2	41.0	73.7	0.14
960816	1900	0.35	0.191	0.191	5.24	5.24	22.0	10.0	-6.8	53.0	50.4	52.4	0.15
960816	2200	0.32	0.191	0.191	5.24	5.24	18.0	18.0	-11.5	51.1	41.9	52.0	0.20
960817	0100	0.32	0.113	0.113	8.87	8.87	-34.0	10.0	-8.6	45.7	37.4	27.6	0.19
960817	0400	0.36	0.113	0.113	8.87	8.87	-34.0	-36.0	-9.0	47.6	37.2	18.6	0.18
960817	0700	0.39	0.123	0.123	8.16	8.16	-36.0	-38.0	-5.6	51.0	41.5	24.7	0.18
960817	1000	0.36	0.113	0.113	8.87	8.87	-40.0	-40.0	-15.8	46.3	38.3	20.1	0.26
960817	1300	0.36	0.132	0.123	7.56	8.16	-42.0	-40.0	-22.1	42.4	35.5	20.9	0.21

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,IFS}$ Hz	$T_{p,FD}$ sec	$T_{p,IFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
960817	1600	0.39	0.132	0.123	7.56	8.16	-38.0	-38.0	-24.0	36.3	31.7	21.0	0.26
960817	1900	0.39	0.132	0.132	7.56	7.56	-40.0	-40.0	-24.1	37.0	32.6	15.8	0.21
960817	2200	0.36	0.142	0.132	7.04	7.56	-44.0	-42.0	-25.9	38.4	31.4	23.4	0.27
960818	0100	0.35	0.142	0.132	7.04	7.56	-42.0	-42.0	-31.4	37.4	29.4	26.2	0.29
960818	0400	0.39	0.123	0.132	8.16	7.56	-32.0	-30.0	-24.7	31.2	25.9	18.8	0.26
960818	0700	0.42	0.064	0.064	15.63	15.63	-20.0	-38.0	-30.4	30.2	28.0	15.8	0.26
960818	1000	0.38	0.064	0.064	15.63	15.63	-10.0	-38.0	-28.1	34.1	32.6	21.1	0.28
960818	1300	0.36	0.123	0.064	8.16	15.63	-38.0	-38.0	-28.5	35.1	32.6	24.4	0.32
960818	1600	0.39	0.123	0.064	8.16	15.63	-36.0	-36.0	-26.3	34.9	32.4	25.6	0.32
960818	1900	0.41	0.064	0.064	15.63	15.63	-14.0	-38.0	-26.5	32.9	29.4	17.7	0.37
960818	2200	0.43	0.132	0.064	7.56	15.63	-38.0	-38.0	-30.8	31.4	26.9	21.4	0.33
960819	0100	0.39	0.123	0.064	8.16	15.63	-38.0	-38.0	-30.0	36.8	34.0	30.0	0.30
960819	0400	0.40	0.113	0.064	8.87	15.63	-34.0	-34.0	-31.5	34.1	32.8	26.7	0.34
960819	0700	0.41	0.123	0.074	8.16	13.56	-32.0	-36.0	-26.7	30.8	29.8	25.6	0.27
960819	1000	0.39	0.123	0.064	8.16	15.63	-38.0	-36.0	-24.0	32.8	31.2	24.8	0.26
960819	1300	0.39	0.064	0.064	15.63	15.63	-14.0	-38.0	-26.3	33.8	28.2	20.8	0.36
960819	1600	0.39	0.074	0.074	13.56	13.56	-18.0	-36.0	-27.8	32.6	29.2	25.5	0.35
960819	1900	0.41	0.074	0.074	13.56	13.56	-20.0	-36.0	-29.7	31.6	25.8	21.8	0.35
960819	2200	0.45	0.123	0.123	8.16	8.16	-36.0	-36.0	-31.5	29.2	24.8	11.9	0.31
960820	0100	0.45	0.123	0.074	8.16	13.56	-40.0	-38.0	-28.5	32.4	26.8	22.9	0.31
960820	0400	0.50	0.074	0.074	13.56	13.56	-10.0	-24.0	-21.4	31.0	25.7	19.3	0.27
960820	0700	0.52	0.132	0.132	7.56	7.56	-34.0	-34.0	-25.9	28.1	23.7	16.9	0.27
960820	1000	0.53	0.132	0.132	7.56	7.56	-38.0	-28.0	-21.1	33.2	27.2	17.5	0.28
960820	1300	0.56	0.074	0.074	13.56	13.56	-12.0	-28.0	-5.1	45.8	32.5	27.0	0.28
960820	1600	0.61	0.074	0.074	13.56	13.56	-12.0	-16.0	-1.6	46.1	35.6	19.9	0.17
960820	1900	0.71	0.074	0.074	13.56	13.56	-6.0	-8.0	15.3	47.8	37.3	19.9	0.19
960820	2200	0.71	0.074	0.201	13.56	4.98	-14.0	-14.0	13.2	45.8	38.9	39.1	0.15
960821	0100	0.68	0.210	0.132	4.75	7.56	30.0	0.0	13.5	39.3	32.1	26.1	0.12
960821	0400	0.70	0.152	0.152	6.59	6.59	-32.0	2.0	-0.8	37.4	32.2	30.5	0.12
960821	0700	0.71	0.181	0.132	5.52	7.56	8.0	6.0	-4.7	34.6	31.7	24.5	0.13
960821	1000	0.68	0.132	0.074	7.56	13.56	-26.0	2.0	-2.6	35.5	35.3	23.5	0.22
960821	1300	0.62	0.074	0.132	13.56	7.56	-16.0	0.0	-1.8	33.3	30.8	23.3	0.21
960821	1600	0.60	0.074	0.074	13.56	13.56	-18.0	-6.0	-2.1	28.4	27.1	21.4	0.19
960821	1900	0.59	0.074	0.132	13.56	7.56	-16.0	-16.0	-5.9	30.8	29.7	20.1	0.18
960821	2200	0.63	0.123	0.123	8.16	8.16	-28.0	-12.0	-13.9	32.5	31.7	22.4	0.21
960822	0100	0.63	0.132	0.132	7.56	7.56	-10.0	-30.0	-22.5	32.1	32.3	25.7	0.24
960822	0400	0.63	0.123	0.123	8.16	8.16	-18.0	-32.0	-21.0	32.2	31.1	26.9	0.18
960822	0700	0.64	0.123	0.123	8.16	8.16	-28.0	-32.0	-24.0	30.6	28.6	22.1	0.17
960822	1000	0.64	0.123	0.123	8.16	8.16	-30.0	-32.0	-28.3	31.1	29.2	18.7	0.21
960822	1300	0.59	0.123	0.123	8.16	8.16	-32.0	-32.0	-26.2	31.0	29.9	24.2	0.24
960822	1600	0.54	0.123	0.113	8.16	8.87	-28.0	-30.0	-25.4	29.3	27.9	26.2	0.25
960822	1900	0.52	0.123	0.123	8.16	8.16	-28.0	-28.0	-24.5	28.4	26.8	22.4	0.17
960822	2200	0.54	0.113	0.123	8.87	8.16	-34.0	-28.0	-26.3	32.7	30.4	31.5	0.21
960823	0100	0.52	0.113	0.123	8.87	8.16	-36.0	-36.0	-27.1	35.4	32.8	29.4	0.22
960823	0400	0.52	0.113	0.123	8.87	8.16	-34.0	-34.0	-29.3	33.4	31.1	29.2	0.22
960823	0700	0.52	0.132	0.123	7.56	8.16	-32.0	-30.0	-23.0	32.0	29.7	29.2	0.18
960823	1000	0.56	0.123	0.123	8.16	8.16	-28.0	-30.0	-30.6	31.4	28.7	24.4	0.24
960823	1300	0.58	0.113	0.113	8.87	8.87	-34.0	-36.0	-31.4	32.0	29.2	32.1	0.26
960823	1600	0.57	0.123	0.113	8.16	8.87	-34.0	-34.0	-34.1	32.7	27.1	32.4	0.22
960823	1900	0.54	0.113	0.113	8.87	8.87	-34.0	-32.0	-22.8	33.8	27.1	33.5	0.17
960823	2200	0.55	0.113	0.113	8.87	8.87	0.0	-28.0	-17.5	33.4	27.0	31.5	0.22
960824	0100	0.50	0.113	0.113	8.87	8.87	-28.0	-30.0	-29.0	31.5	28.3	32.4	0.23
960824	0400	0.47	0.113	0.113	8.87	8.87	-30.0	-30.0	-28.3	30.9	28.3	29.8	0.26

Appendix A Table of Collection Times and Bulk Parameters

Table A1 (Continued)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,IDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{IDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	X
960824	0700	0.46	0.113	0.113	8.87	8.87	-32.0	-30.0	-29.1	31.2	29.0	31.9	0.19
960824	1000	0.44	0.132	0.123	7.56	8.16	-28.0	-28.0	-23.5	30.8	28.6	31.8	0.27
960824	1300	0.42	0.132	0.113	7.56	8.87	-32.0	-34.0	-26.0	31.8	28.4	29.7	0.35
960824	1600	0.42	0.318	0.113	3.15	8.87	-52.0	-34.0	-23.8	34.8	22.0	27.5	0.30
960824	1900	0.39	0.308	0.123	3.25	8.16	-52.0	-52.0	-27.0	33.7	22.2	26.2	0.25
960824	2200	0.35	0.123	0.123	8.16	8.16	-8.0	-30.0	-19.6	30.5	26.0	25.0	0.25
960825	0100	0.36	0.123	0.123	8.16	8.16	0.0	-30.0	-17.0	32.1	34.4	29.0	0.27
960825	0400	0.40	0.123	0.123	8.16	8.16	-28.0	-28.0	5.2	51.7	33.2	29.7	0.25
960825	0700	0.45	0.269	0.123	3.72	8.16	64.0	60.0	19.9	77.8	25.2	27.2	0.20
960825	1000	0.38	0.123	0.123	8.16	8.16	-26.0	-28.0	2.7	67.1	27.9	25.2	0.22
960825	1300	0.34	0.123	0.123	8.16	8.16	-30.0	-28.0	-1.5	36.4	39.3	27.0	0.32
960825	1600	0.33	0.113	0.113	8.87	8.87	-2.0	-30.0	0.4	43.6	36.4	27.6	0.29
960825	1900	0.35	0.123	0.123	8.16	8.16	-28.0	-30.0	3.2	57.9	30.3	20.8	0.29
960825	2200	0.33	0.123	0.123	8.16	8.16	-30.0	-32.0	-10.7	39.1	29.7	28.8	0.25
960826	0100	0.33	0.123	0.123	8.16	8.16	-30.0	-30.0	-10.1	36.7	28.7	25.9	0.35
960826	0400	0.33	0.308	0.113	3.25	8.87	44.0	-24.0	-5.4	45.5	28.2	28.3	0.37
960826	0700	0.31	0.113	0.123	8.87	8.16	-32.0	-30.0	-7.3	51.4	26.8	25.6	0.33
960826	1000	0.34	0.269	0.083	3.72	11.98	44.0	44.0	4.0	54.4	27.9	36.0	0.25
960826	1300	0.32	0.123	0.083	8.16	11.98	-32.0	-32.0	-17.2	37.6	31.0	26.7	0.34
960826	1600	0.33	0.123	0.083	8.16	11.98	-30.0	-30.0	-8.2	37.3	31.7	32.6	0.33
960826	1900	0.35	0.083	0.083	11.98	11.98	-12.0	-12.0	-10.6	35.3	32.8	30.4	0.34
960826	2200	0.34	0.093	0.083	10.72	11.98	2.0	2.0	-9.7	35.2	33.5	29.4	0.25
960827	0100	0.37	0.093	0.093	10.72	10.72	6.0	4.0	-8.6	36.4	31.2	24.2	0.27
960827	0400	0.37	0.103	0.093	9.71	10.72	8.0	6.0	-3.5	36.4	32.9	31.2	0.33
960827	0700	0.37	0.083	0.093	11.98	10.72	-12.0	-10.0	-9.8	37.1	34.8	29.3	0.36
960827	1000	0.38	0.093	0.093	10.72	10.72	4.0	4.0	-7.0	33.8	33.1	32.3	0.28
960827	1300	0.41	0.103	0.093	9.71	10.72	2.0	2.0	-5.1	35.0	33.3	31.5	0.28
960827	1600	0.41	0.093	0.093	10.72	10.72	-6.0	-6.0	-19.1	32.5	30.0	24.3	0.34
960827	1900	0.41	0.093	0.093	10.72	10.72	-10.0	-8.0	-18.5	36.1	28.9	25.4	0.35
960827	2200	0.40	0.093	0.093	10.72	10.72	2.0	-28.0	-18.1	33.3	32.0	27.3	0.27
960828	0100	0.42	0.103	0.103	9.71	9.71	0.0	0.0	-12.0	33.2	30.3	29.1	0.27
960828	0400	0.41	0.103	0.103	9.71	9.71	-4.0	-6.0	-20.6	34.2	31.6	31.2	0.36
960828	0700	0.41	0.103	0.103	9.71	9.71	-18.0	-12.0	-20.1	35.9	36.1	29.2	0.43
960828	1000	0.43	0.064	0.064	15.63	15.63	-34.0	-34.0	-21.3	33.0	31.0	22.0	0.36
960828	1300	0.49	0.064	0.064	15.63	15.63	-18.0	-16.0	-23.9	30.0	25.1	19.0	0.38
960828	1600	0.55	0.064	0.064	15.63	15.63	-22.0	-22.0	-28.0	28.4	23.6	15.8	0.41
960828	1900	0.58	0.064	0.064	15.63	15.63	-24.0	-24.0	-25.7	31.2	26.2	16.9	0.48
960828	2200	0.56	0.074	0.074	13.56	13.56	-34.0	-22.0	-21.4	33.4	29.3	16.7	0.30
960829	0100	0.61	0.074	0.074	13.56	13.56	-20.0	-20.0	-18.4	27.5	26.3	17.6	0.25
960829	0400	0.85	0.074	0.074	13.56	13.56	-20.0	-20.0	2.3	52.1	25.2	19.0	0.38
960829	0700	1.06	0.074	0.074	13.56	13.56	-24.0	-24.0	2.3	60.6	22.9	16.4	0.34
960829	1000	1.07	0.074	0.074	13.56	13.56	-36.0	-38.0	-8.0	52.6	24.6	17.9	0.20
960829	1300	1.08	0.074	0.074	13.56	13.56	-22.0	-22.0	1.3	46.5	24.5	15.9	0.12
960829	1600	1.10	0.074	0.074	13.56	13.56	-22.0	-22.0	-4.0	40.6	23.7	15.2	0.23
960829	1900	1.01	0.074	0.074	13.56	13.56	-24.0	-24.0	-10.6	37.4	24.1	14.4	0.40
960829	2200	0.93	0.074	0.074	13.56	13.56	-28.0	-28.0	-11.4	29.5	22.7	12.0	0.24
960830	0100	0.97	0.074	0.074	13.56	13.56	-26.0	-26.0	-12.4	27.3	25.5	16.9	0.12
960830	0400	1.17	0.074	0.074	13.56	13.56	-26.0	-26.0	-16.8	23.0	21.8	10.7	0.20
960830	0700	1.26	0.074	0.074	13.56	13.56	-28.0	-30.0	-19.7	25.9	22.5	12.8	0.25
960830	1000	1.15	0.074	0.074	13.56	13.56	-26.0	-24.0	-20.9	23.4	22.0	16.2	0.25
960830	1300	1.08	0.074	0.083	13.56	11.98	-32.0	-32.0	-24.0	25.3	24.7	24.0	0.13
960830	1600	1.12	0.074	0.083	13.56	11.98	-28.0	-34.0	-23.1	29.0	25.9	24.7	0.20
960830	1900	1.14	0.064	0.064	15.63	15.63	-38.0	-34.0	-24.0	31.5	26.3	17.9	0.26
960830	2200	1.21	0.064	0.064	15.63	15.63	-34.0	-34.0	-23.6	31.5	25.8	10.7	0.21

(Sheet 53 of 54)

Table A1 (Concluded)

Date	Time EST	H_{mo} m	$f_{p,FD}$ Hz	$f_{p,JFS}$ Hz	$T_{p,FD}$ sec	$T_{p,JFS}$ sec	$\theta_{p,FD}$ deg	$\theta_{p,JDS}$ deg	$\theta_{p,SW}$ deg	$\Delta\theta_{JDS}$ deg	$\Delta\theta_{SW}$ deg	$\Delta\theta_{FDP}$ deg	χ
960831	0100	1.19	0.074	0.074	13.56	13.56	-28.0	-30.0	-25.2	26.6	25.5	8.7	0.10
960831	0400	1.35	0.074	0.093	13.56	10.72	-32.0	-32.0	-16.9	29.0	28.4	25.3	0.14
960831	0700	1.62	0.074	0.064	13.56	15.63	-32.0	-32.0	-16.1	37.4	27.7	17.0	0.18
960831	1000	1.91	0.064	0.064	15.63	15.63	-26.0	-28.0	-2.7	46.8	25.0	15.2	0.14
960831	1300	2.08	0.064	0.152	15.63	6.59	-38.0	-26.0	0.1	43.7	24.8	18.8	0.10
960831	1600	2.20	0.074	0.074	13.56	13.56	-26.0	-26.0	4.6	45.3	25.5	13.7	0.10
960831	1900	2.46	0.064	0.064	15.63	15.63	-20.0	-22.0	1.1	47.4	26.4	17.9	0.15
960831	2200	2.64	0.083	0.074	11.98	13.56	-38.0	-30.0	-4.4	47.9	27.9	19.2	0.15

(Sheet 54 of 54)

Appendix B
Time Series Graphs of Bulk Parameters
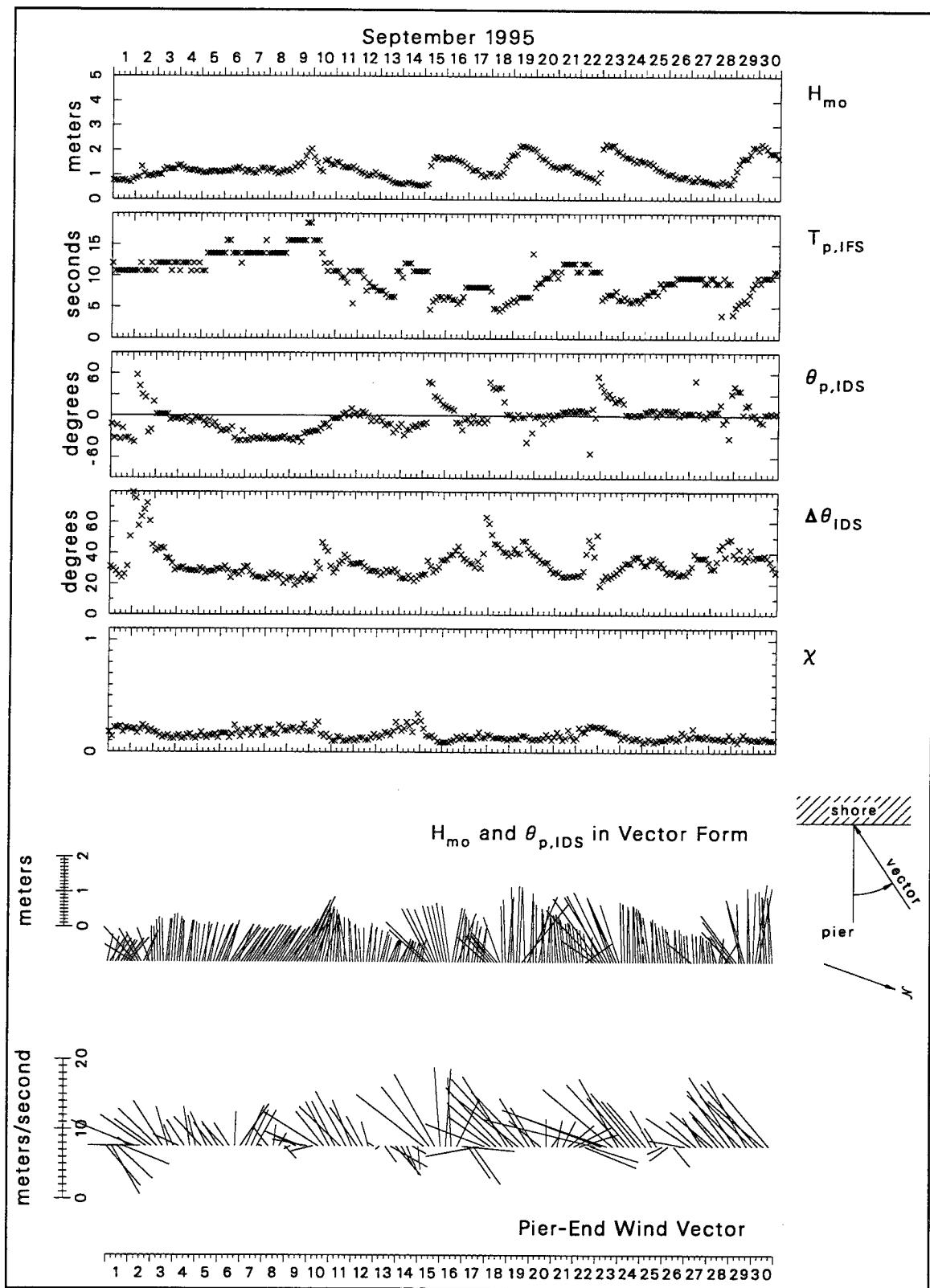
Figure B1. Bulk data for September 1995
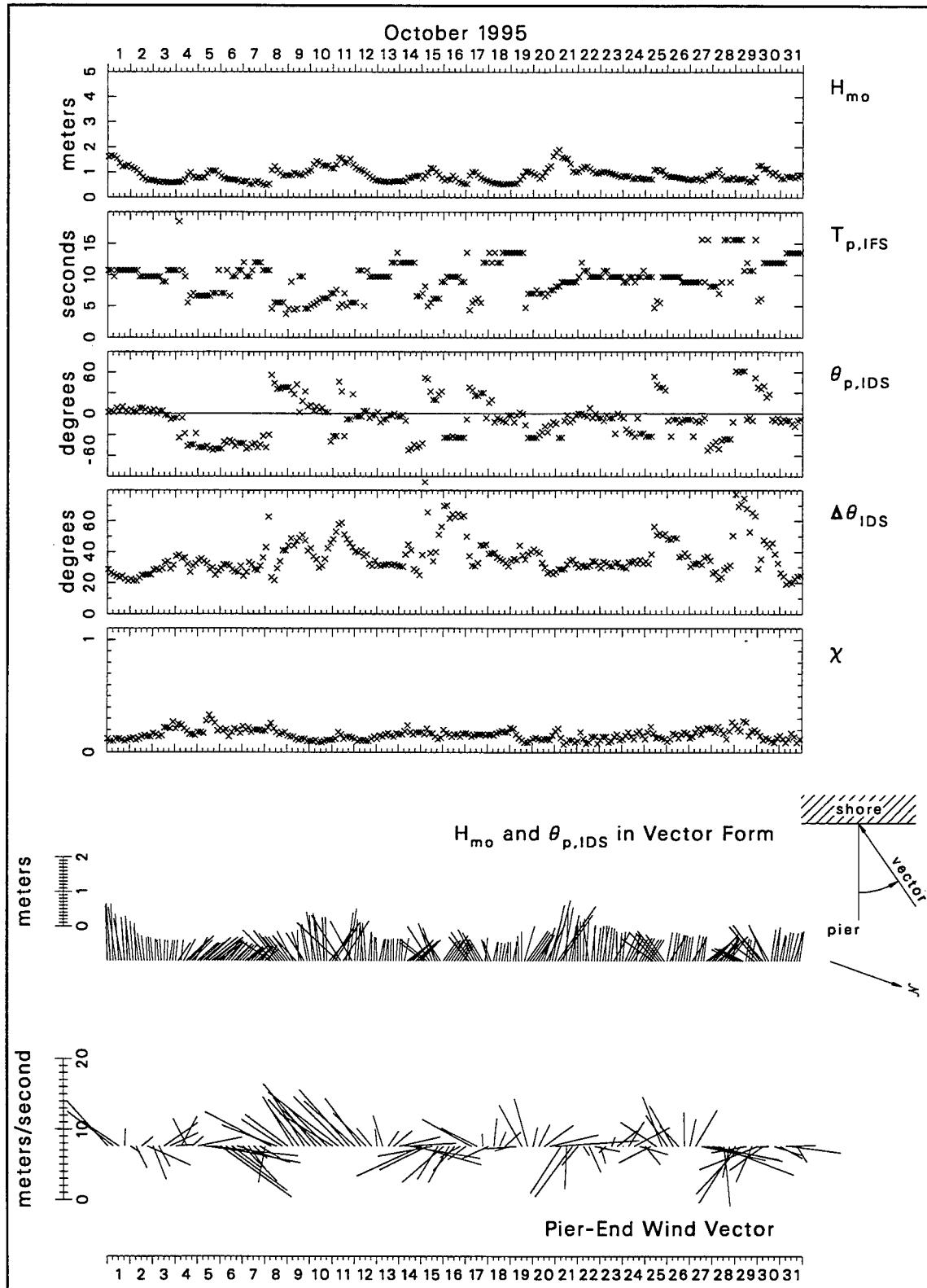
Figure B2. Bulk data for October 1995
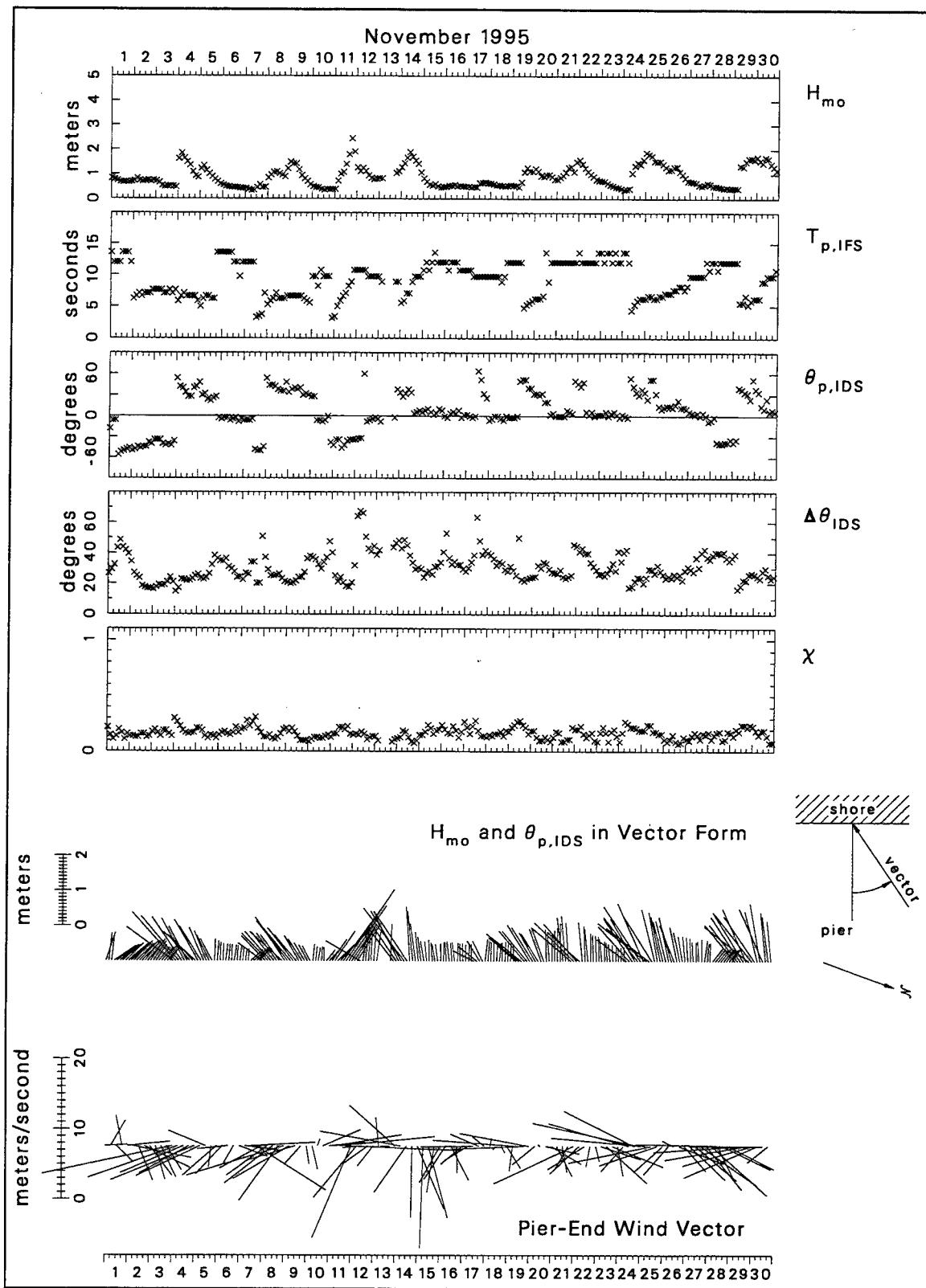
Figure B3. Bulk data for November 1995
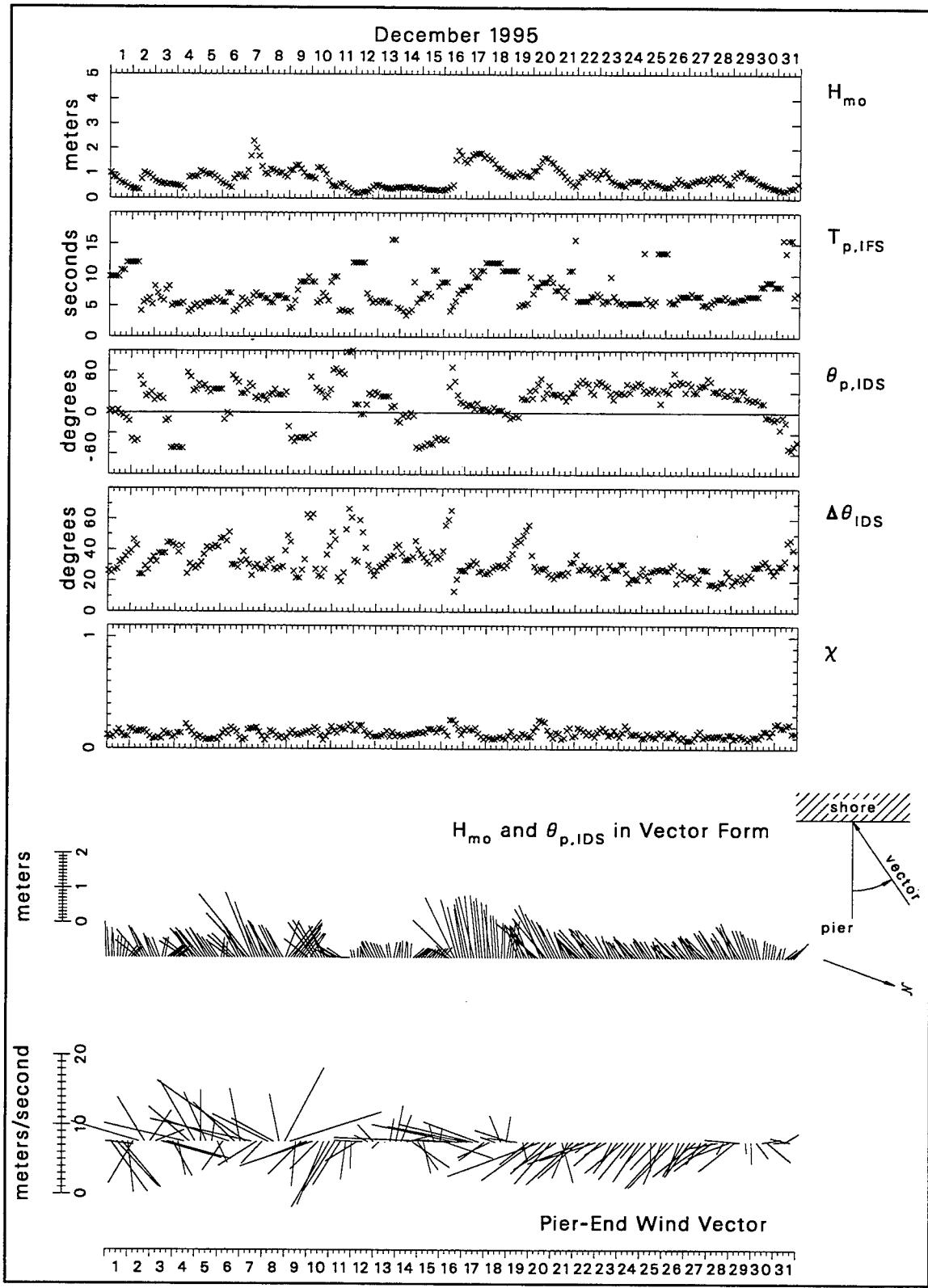
Figure B4. Bulk data for December 1995
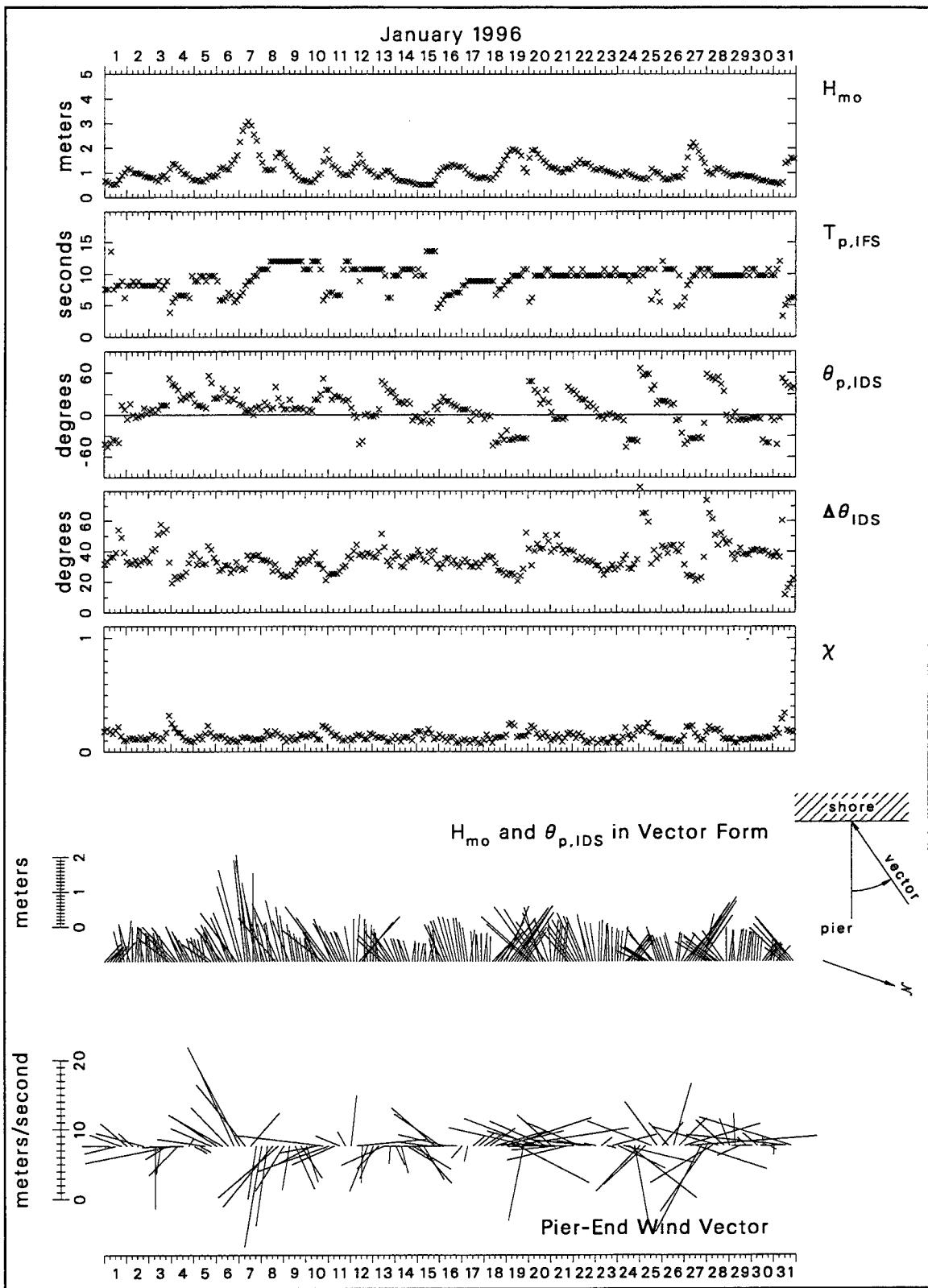
Figure B5. Bulk data for January 1996
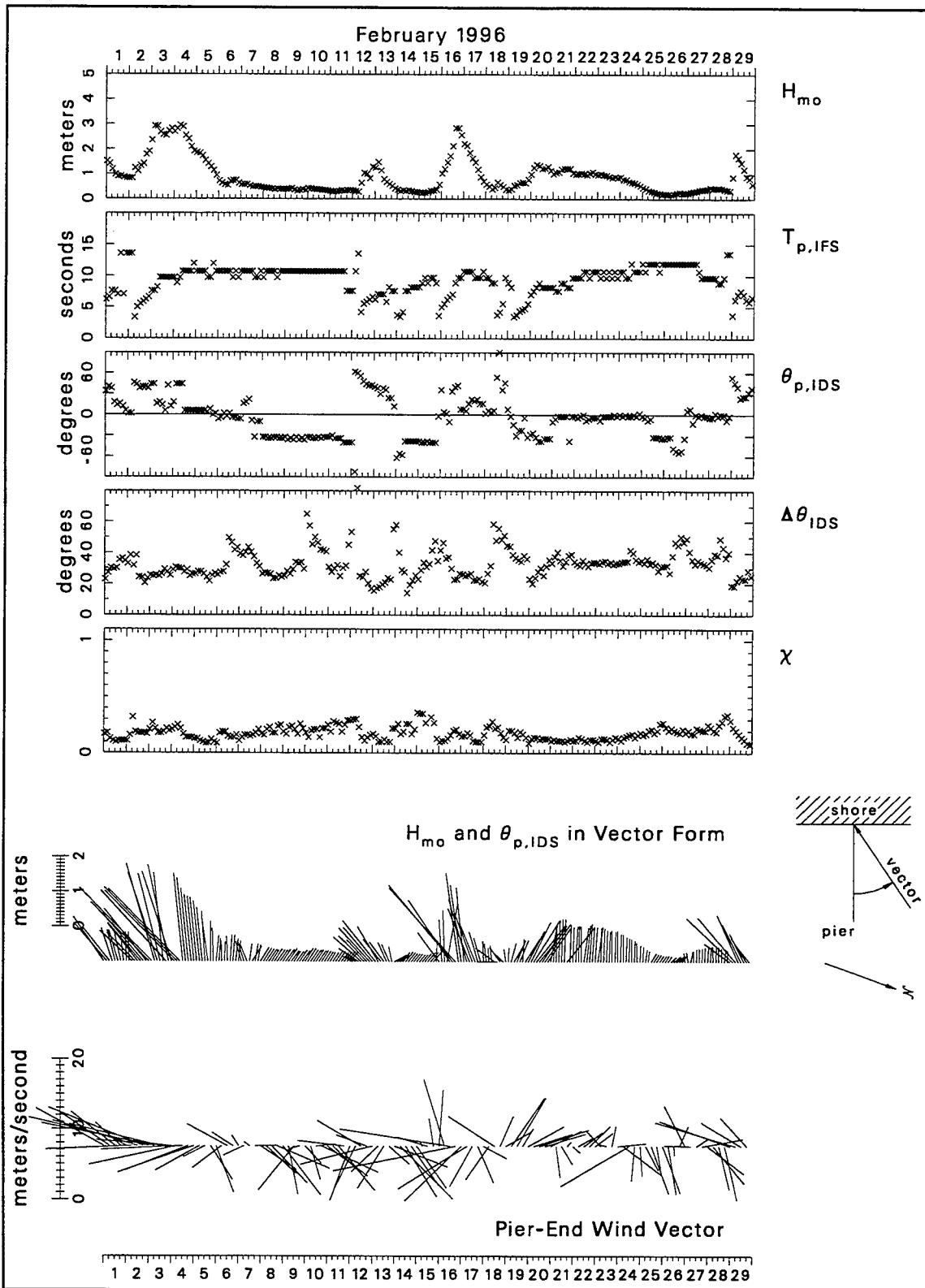
Figure B6. Bulk data for February 1996
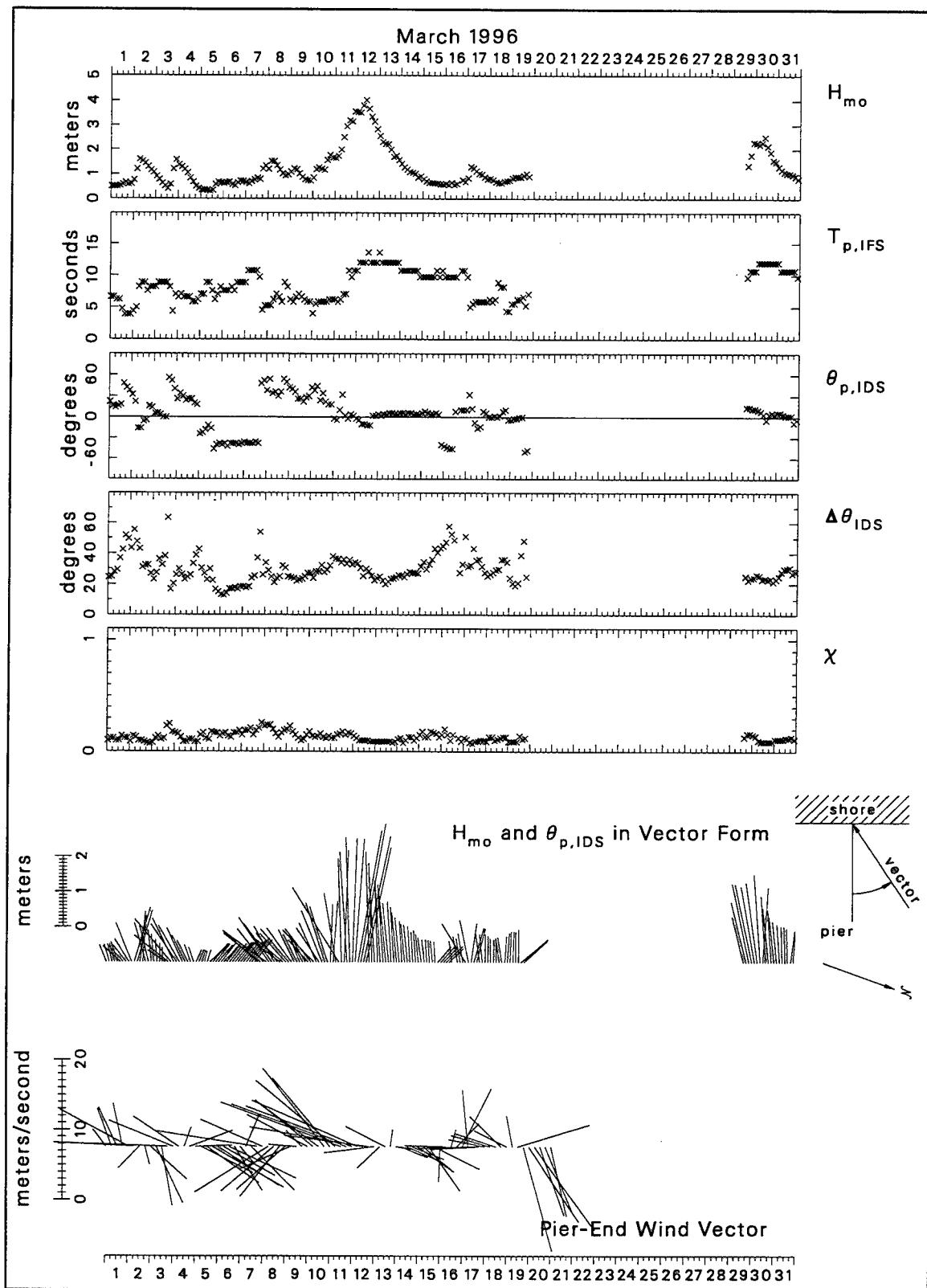
Figure B7. Bulk data for March 1996
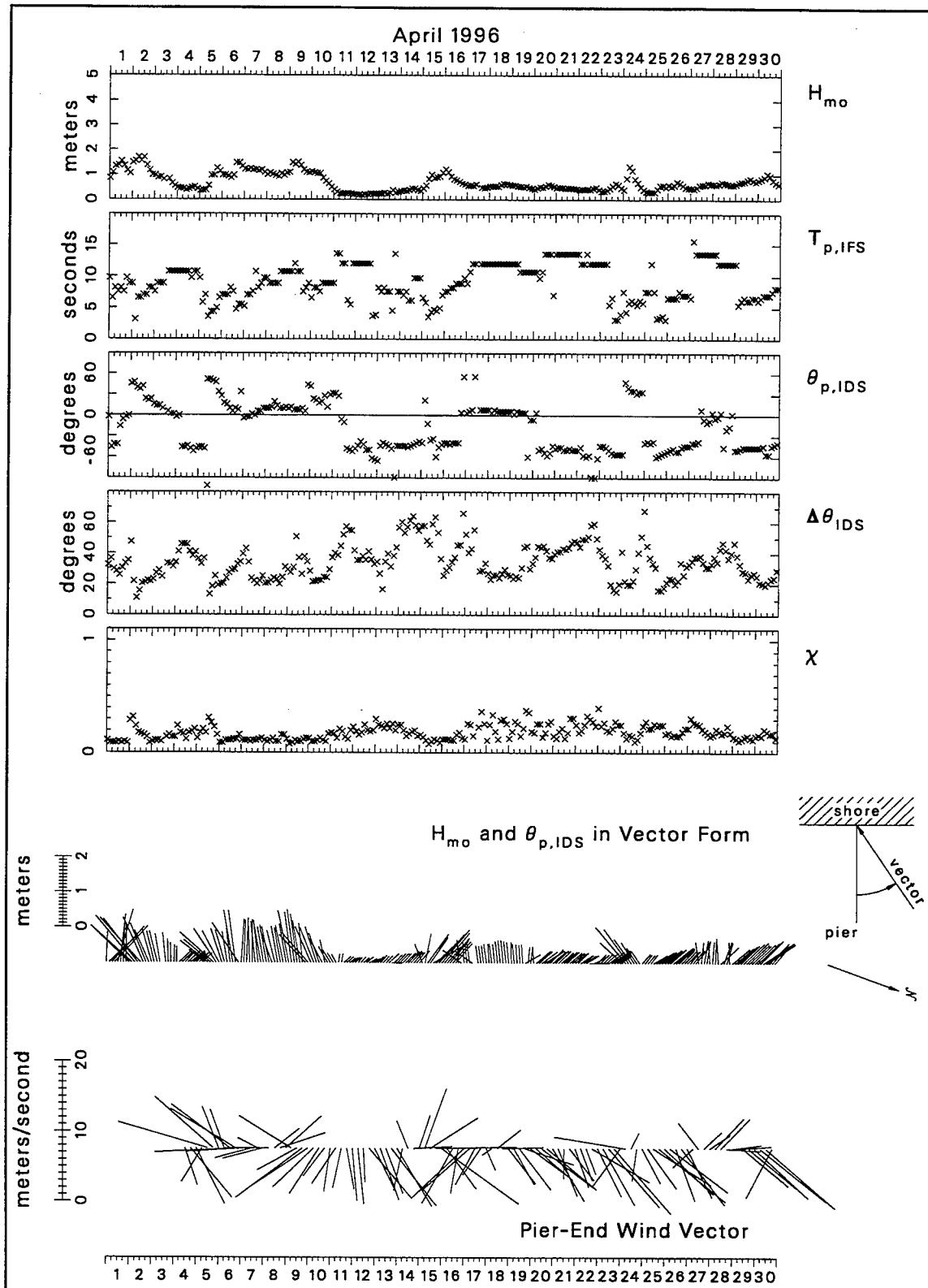
Figure B8. Bulk data for April 1996
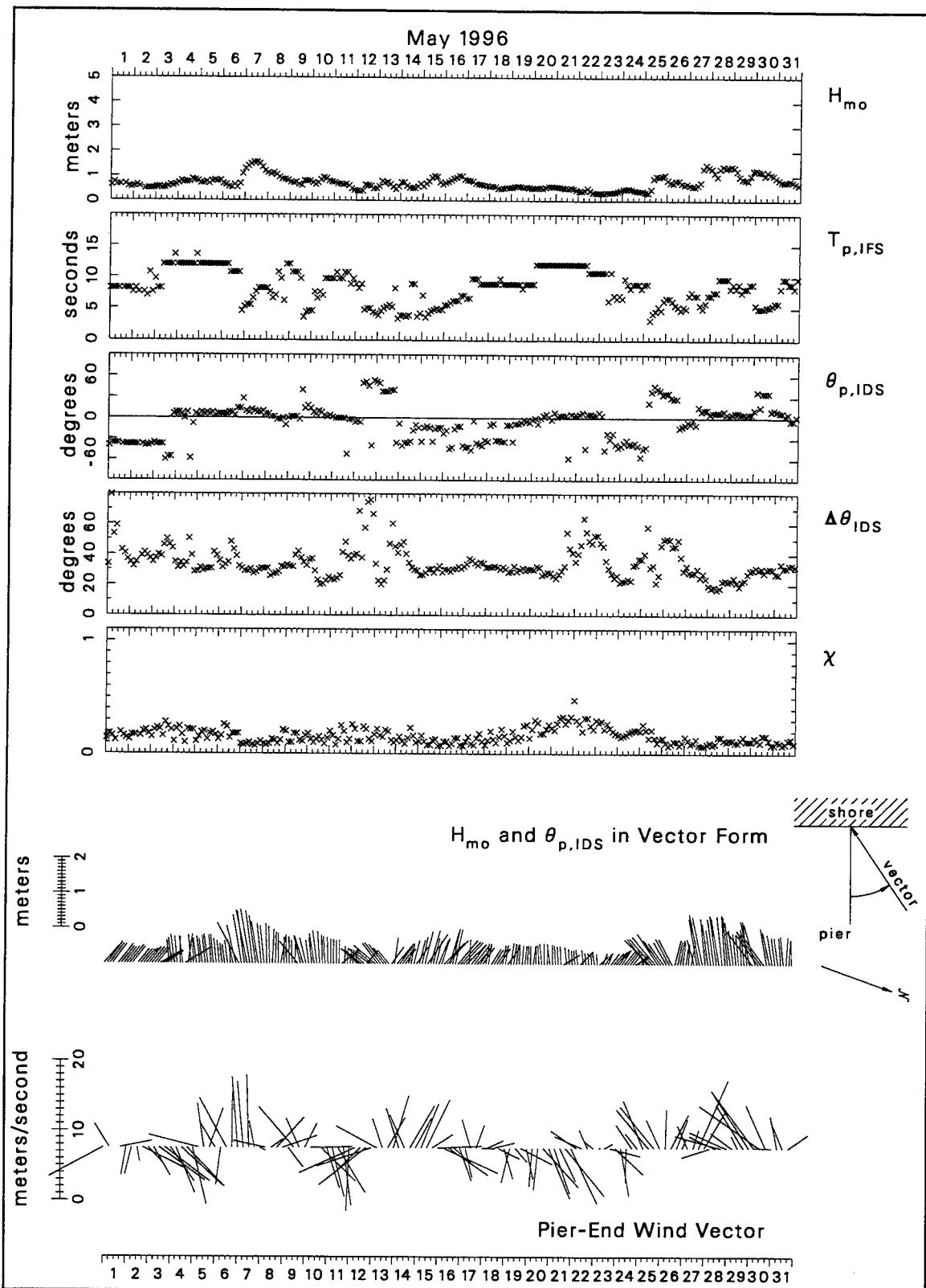
Figure B9. Bulk data for May 1996
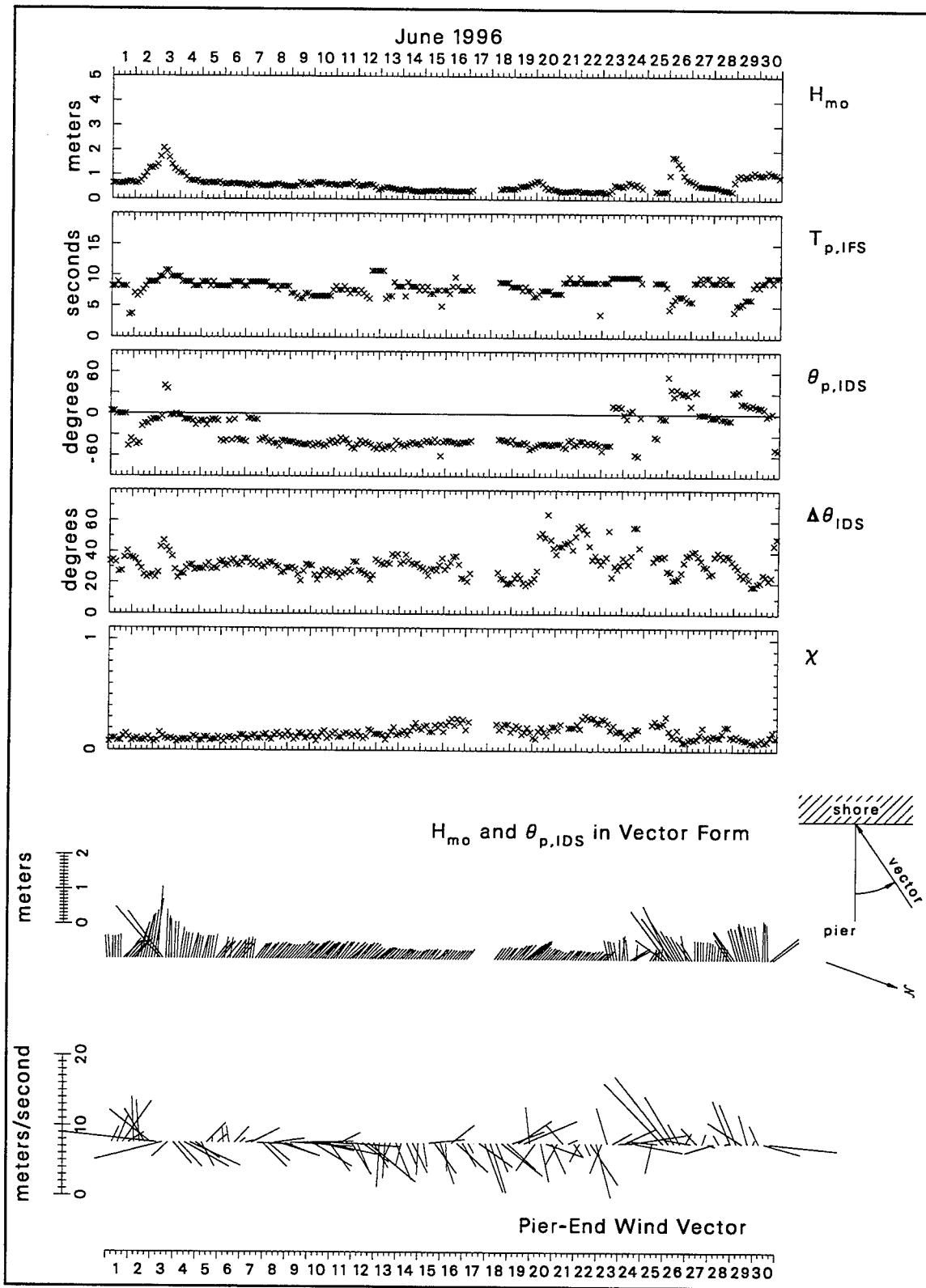
Figure B10. Bulk data for June 1996
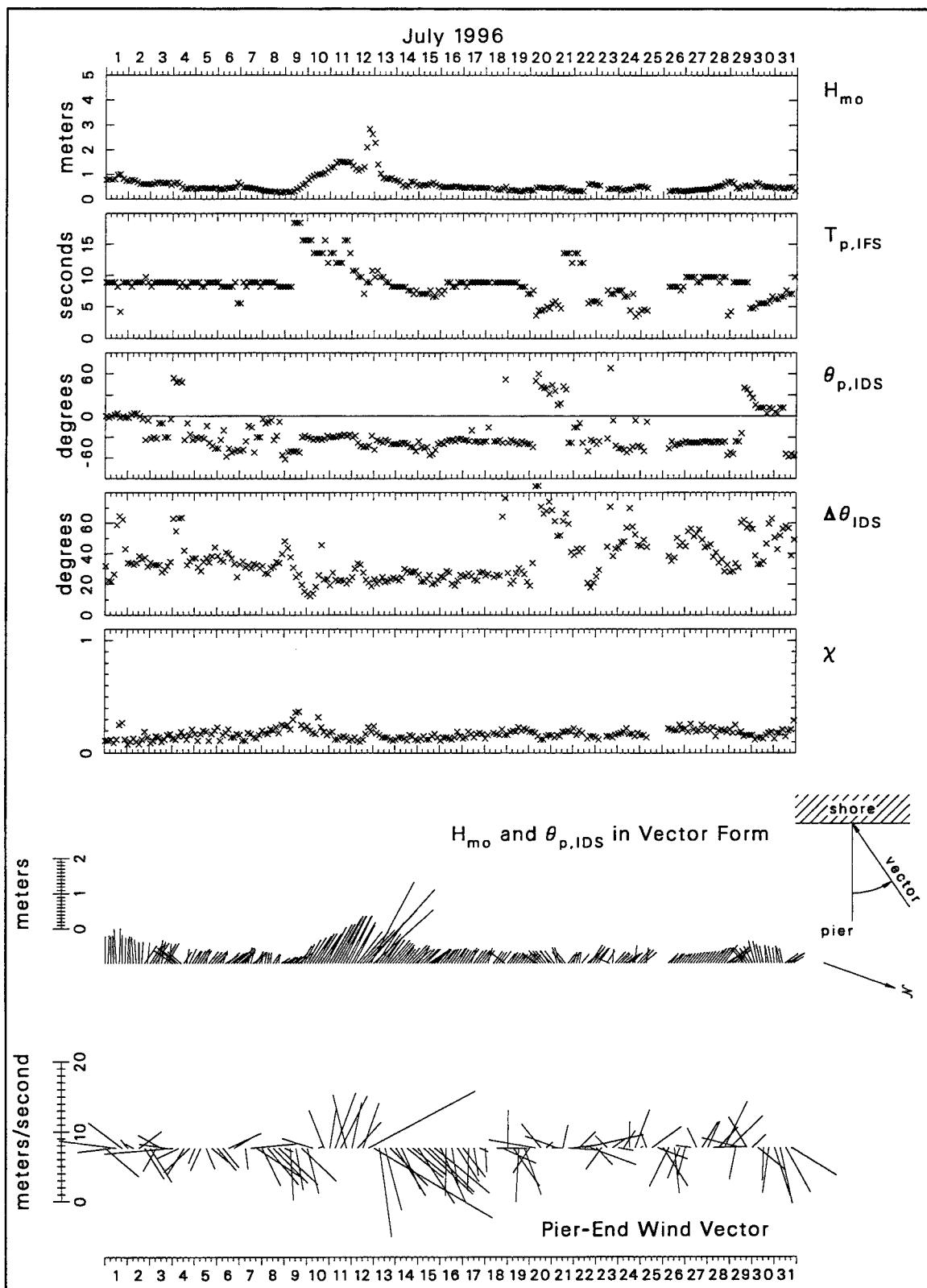
Figure B11. Bulk data for July 1996
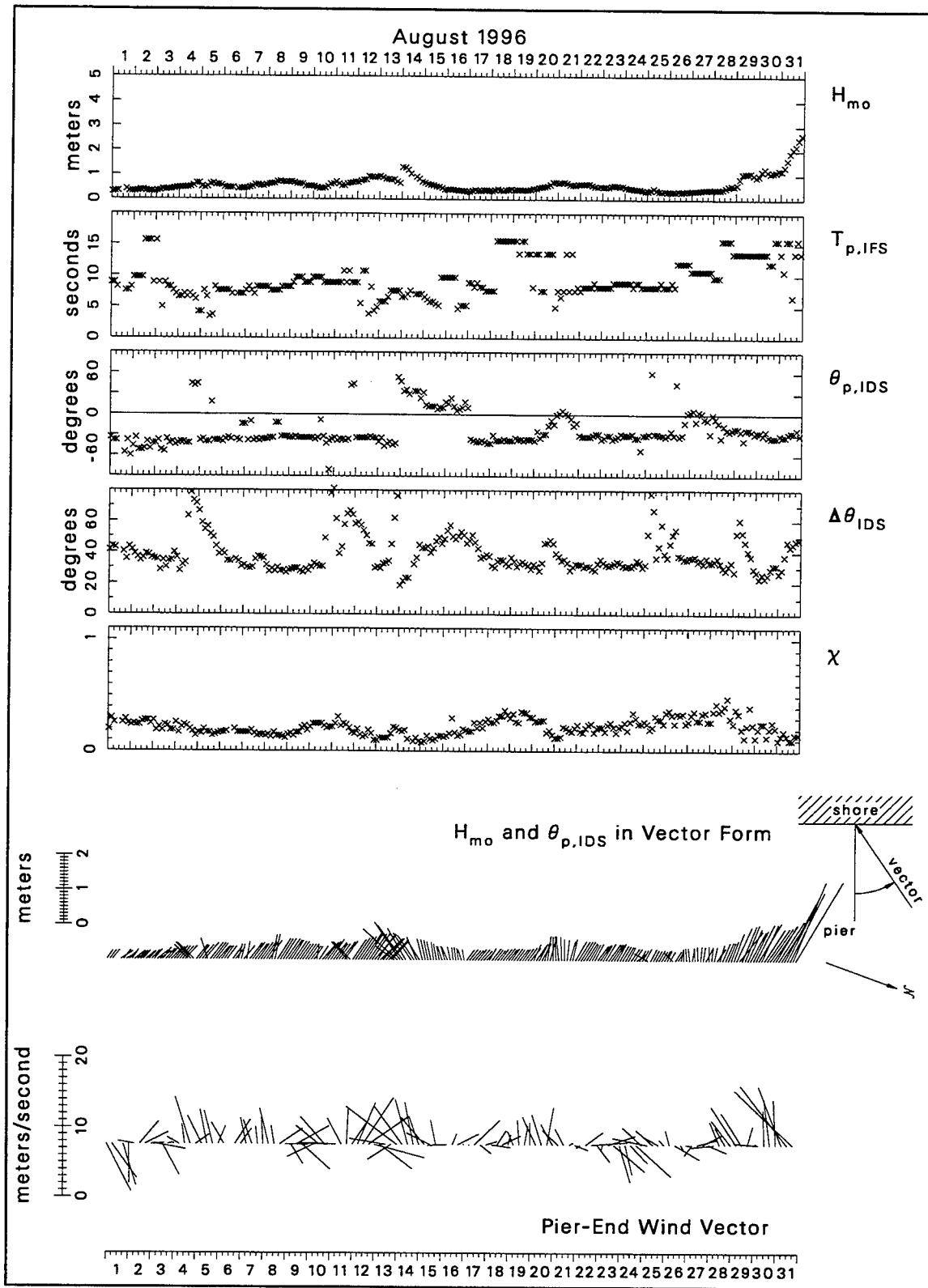
Figure B12. Bulk data for August 1996

Appendix C
Listing of FORTRAN Computer Program

```
        program readascii
c
c  This program has the codes to read FRF 8-m
c  array directional spectral ASCII output files.
c  This program simply reads the ASCII file and
c  writes an ASCII file as a test of the code.
c  You will have to tune the I/O statements to
c  your own system...
c
c  Variable names, units and meanings are:
c
c=========================================================================
c
c      datetime...[character*10] Date and Eastern Standard Time of
c                 beginning of data collection in the order year,
c                 month, day, hour, minute and in the form
c                 yymmddhhmm (2-digit year, no blanks in any field)
c          Hmo...[m] Energy-based characteristic wave height =
c                 4*sigma, where sigma^2 is the variance of sea
c                 surface displacement = volume under frequency-
c                 direction (f-d) spectrum
c           fp...[Hz] Frequency at the peak of the frequency spectrum
c          thp...[deg] Direction at the peak of the directional
c                 distribution at f=fp
c
c       ifimle...Algorithm flag: [1]=IMLE estimate, [0]=MLE estimate
c
c        istot...[sec] Length of time series processed
c         sfrq...[Hz] Data sampling frequency in time series
c
c      ifwindo...Windowing flag: [0]=data segments not windowed,
c                 [1]=data segments windowed (Kaiser-Bessel window)
c       ifdtrnd...Detrending flag: [0]=data segments not detrended,
c                 [1]=data segments detrended (linear trend removed)
c         nfft...Number of data points in a data segment
c        nensb...Number of half-lapped segments analyzed
c        nband...Number of frequency bands averaged for frequency
c                 smoothing
c        idgfr...Degrees of freedom of final frequency spectral
c                 estimates
c
c        nofrq...Number of output frequency bands
c        delfs...[Hz] Width of an output frequency band
```

Figure C1. Listing of FORTRAN Computer Program (Sheet 1 of 4)

```
c          noang...Number of output direction bins (arcs)
c        odelang...[deg] Width of an output direction bin
c
c          dmin...[m] Minimum water depth during time series at
c                  8-m array reference gage 'rname'
c          dbar...[m] Mean water depth during time series at
c                  reference gage
c          dmax...[m] Maximum water depth during time series at
c                  reference gage
c         rname...Reference gage ID (FRF gage name - get help if
c                  you need to know which 8-m array gage it was)
c
c           s9b...[m/sec] Mean wind speed at pier end anemometer
c                  (19.5 m above mean sea level) during time series
c           s9s...[m/sec] Standard deviation of wind speed at pier
c                  end anemometer
c           s9m...[m/sec] Maximum wind speed at pier end anemometer
c           d9b...[deg] Vector averaged mean wind direction at pier
c                  end anemometer - direction from which wind blows
c                  in wave direction coordinates (degrees counter-
c                  clockwise from shore normal)
c           d9s...[deg] Measure of variability of wind direction at pier
c                  end anemometer = arctangent[(standard deviation of
c                  cross-mean-streamline wind speed)/(mean wind speed)]
c
c           s8b...   These are the same as s9b, s9s, s9m, d9b,
c           s8s...      and d9s, except they are from the secondary
c           s8m...        anemometer at the seaward end of the pier, less
c           d8b...          than 2 m away from the primary anemometer and at
c           d8s...            19.5 m above mean sea level
c
c        oangle...[deg] Array of wave direction coordinates that
c                  aligns with the f-d spectral array
c
c           nof...(Within a loop) Frequency index
c           noa...(Within a loop) Direction index
c       of(nof)...[Hz] Frequency
c      osf(nof)...[m^2/Hz] Frequency spectral density at frequency
c                  of(nof)
c     ogpat(nof)...[character*16] Encoded list of gages used to compute
c                  directional distribution of energy at this frequency
c     itero(nof)...Number of IMLE iterations used to compute directional
c                  distribution of energy at this frequency
c  ospc(nof,noa)...[1/deg] Normalized frequency-direction spectral den-
c                  sity at frequency of(nof) and direction oangle(noa).
c                  Dimensional frequency-direction spectrum spc(nof,noa)
c                  [in m^2/(Hz deg)] is found from:
c
c                      spc(nof,noa) = osf(nof)*ospc(nof,noa)
c
c===========================================================================
c
c links:  none
c
      character*4              rname
      character*10             datetime
      character*16            ogpat(29)
      character*16             infile,        outfile
      dimension               of(29),        osf(29),       itero(29)
      dimension             oangle(181),   ospc(29,181)
c
c ask user for input and output file names
c
      write(*,'(2x,''Enter input file name...: '')')
      read(*,'(a)') infile
      write(*,'(2x,''Enter output file name...: '')')
```

Figure C1. (Sheet 2 of 4)

```
         read(*,'(a)') outfile
c
c  open input file and read data
c
      open(10,file=infile,status='unknown',access='sequential',
     & form='formatted')
c
      read(10,'(a10,f10.2,f10.5,f10.1,2i10,f10.2,i10)')
     &   datetime,      Hmo,         fp,        thp,
     &      ifimle,   istot,       sfrq,   ifwindo
c
      read(10,'(6i10,f10.5,i10)')
     &      ifdtrnd,        nfft,       nensb,         nband,
     &       idgfr,       nofrq,       delfs,         noang
c
      read(10,'(4f10.2,6x,a4,3f10.2)')
     &      odelang,        dmin,        dbar,         dmax,
     &       rname,         s9b,         s9s,          s9m
c
      read(10,'(2f10.1,3f10.2,2f10.1)')
     &           d9b,         d9s,         s8b,         s8s,
     &           s8m,         d8b,         d8s
c
      read(10,'(10f8.1)') (oangle(noa),noa=1,noang)
c
      do 700 nof=1,nofrq
c
        read(10,'(i10,f10.5,e20.7,4x,a16,i10)')
     &          nof,    of(nof),    osf(nof), ogpat(nof),
     &     itero(nof)
c
        read(10,'(8f10.7)') (ospc(nof,noa),noa=1,noang)
c
700    continue
c
      close(10)
c
c  open output file and write variables just read
c
      open(11,file=outfile,status='unknown',access='sequential',
     & form='formatted')
c
      write(11,'(a10,f10.2,f10.5,f10.1,2i10,f10.2,i10)')
     &   datetime,      Hmo,         fp,        thp,
     &      ifimle,   istot,       sfrq,   ifwindo
c
      write(11,'(6i10,f10.5,i10)')
     &      ifdtrnd,        nfft,       nensb,         nband,
     &       idgfr,       nofrq,       delfs,         noang
c
      write(11,'(4f10.2,6x,a4,3f10.2)')
     &      odelang,        dmin,        dbar,         dmax,
     &       rname,         s9b,         s9s,          s9m
c
      write(11,'(2f10.1,3f10.2,2f10.1)')
     &           d9b,         d9s,         s8b,         s8s,
     &           s8m,         d8b,         d8s
c
      write(11,'(10f8.1)') (oangle(noa),noa=1,noang)
c
      do 800 nof=1,nofrq
c
        write(11,'(i10,f10.5,e20.7,4x,a16,i10)')
     &          nof,    of(nof),    osf(nof), ogpat(nof),
     &     itero(nof)
c
```

Figure C1. (Sheet 3 of 4)

```
        write(11,'(8f10.7)') (ospc(nof,noa),noa=1,noang)
c
800     continue
c
        close(11)
c
        end
```

Figure C1. (Sheet 4 of 4)

Appendix D
Listing of Sample Data File

```
 9509221900        0.74   0.09326       12.0           1       8192       2.00           1
         0         2048         15         10         160         29    0.00977          91
      2.00         8.15       8.38       8.59         191        5.63       1.32        9.63
    -111.5          6.8       5.41       1.31        9.40      -117.5        6.4
    -90.0    -88.0    -86.0    -84.0    -82.0    -80.0    -78.0    -76.0    -74.0    -72.0
    -70.0    -68.0    -66.0    -64.0    -62.0    -60.0    -58.0    -56.0    -54.0    -52.0
    -50.0    -48.0    -46.0    -44.0    -42.0    -40.0    -38.0    -36.0    -34.0    -32.0
    -30.0    -28.0    -26.0    -24.0    -22.0    -20.0    -18.0    -16.0    -14.0    -12.0
    -10.0     -8.0     -6.0     -4.0     -2.0      0.0      2.0      4.0      6.0      8.0
     10.0     12.0     14.0     16.0     18.0     20.0     22.0     24.0     26.0     28.0
     30.0     32.0     34.0     36.0     38.0     40.0     42.0     44.0     46.0     48.0
     50.0     52.0     54.0     56.0     58.0     60.0     62.0     64.0     66.0     68.0
     70.0     72.0     74.0     76.0     78.0     80.0     82.0     84.0     86.0     88.0
     90.0
         1      0.04443       0.7156434E-02    9872456                        30
0.0092438 0.0093214 0.0089488 0.0080437 0.0067569 0.0052580 0.0038119 0.0026215
0.0017767 0.0012764 0.0011073 0.0012290 0.0017547 0.0029437 0.0050248 0.0078872
0.0108134 0.0128918 0.0133137 0.0121752 0.0099569 0.0075828 0.0055685 0.0041926
0.0034164 0.0031738 0.0033894 0.0040306 0.0050472 0.0062986 0.0075544 0.0084781
0.0088181 0.0084787 0.0076315 0.0065300 0.0054992 0.0047539 0.0044145 0.0045260
0.0051219 0.0061877 0.0076103 0.0090920 0.0102023 0.0105339 0.0099501 0.0086786
0.0071771 0.0058687 0.0049790 0.0045426 0.0044880 0.0046963 0.0050106 0.0052794
0.0053726 0.0051899 0.0047574 0.0041247 0.0034178 0.0027438 0.0021884 0.0017945
0.0015745 0.0015356 0.0016840 0.0020663 0.0027175 0.0036852 0.0049178 0.0062393
0.0073056 0.0077731 0.0073887 0.0062268 0.0046127 0.0030669 0.0019417 0.0012606
0.0009664 0.0009548 0.0012079 0.0018023 0.0028236 0.0043640 0.0063562 0.0085823
0.0107685 0.0126109 0.0136720
         2      0.05420       0.7959811E-02    9872456                        30
0.0058250 0.0057809 0.0055536 0.0051411 0.0045777 0.0039157 0.0032215 0.0025675
0.0020222 0.0016347 0.0014391 0.0014712 0.0018131 0.0026183 0.0040651 0.0061593
0.0084969 0.0103398 0.0110526 0.0104991 0.0090351 0.0072208 0.0055242 0.0042051
0.0033375 0.0029011 0.0028662 0.0032482 0.0041301 0.0056177 0.0077457 0.0103333
0.0129032 0.0147933 0.0154918 0.0149763 0.0137997 0.0127467 0.0124146 0.0129296
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Figure D1. Listing of sample data file (Sheet 1 of 7)

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0.0008194 0.0010300 0.0013211 0.0016778 0.0020724 0.0024709 0.0028396 0.0031514
0.0033867 0.0035339 0.0035856
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0.0011416 0.0011846 0.0012223 0.0012522 0.0012736 0.0012877 0.0012959 0.0013003
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0.0006579 0.0006453 0.0006348
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0.0002728 0.0002703 0.0002684
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0.0003373 0.0003335 0.0003299
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Figure D1. (Sheet 2 of 7)

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0.0001507 0.0001505 0.0001506
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0.0001526 0.0001491 0.0001462 0.0001439 0.0001421 0.0001407 0.0001399 0.0001394
0.0001394 0.0001397 0.0001403
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0.0002582 0.0002578 0.0002580
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0.0002224 0.0002207 0.0002203
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Figure D1. (Sheet 3 of 7)

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0.0129941 0.0117051 0.0099854 0.0082651 0.0068365 0.0058101 0.0051788 0.0048899
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0.0002440 0.0002463 0.0002497 0.0002537 0.0002580 0.0002622 0.0002661 0.0002694
0.0002720 0.0002738 0.0002747
        15      0.18115        0.6612477E-01      23456                30
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0.0007080 0.0007139 0.0007157
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0.0002963 0.0002850 0.0002755 0.0002676 0.0002611 0.0002559 0.0002519 0.0002489
0.0002469 0.0002459 0.0002458
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0.0004024 0.0004050 0.0004086 0.0004126 0.0004168 0.0004207 0.0004242 0.0004273
0.0004298 0.0004317 0.0004327
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0.0005227 0.0004975 0.0004715 0.0004456 0.0004207 0.0003973 0.0003760 0.0003568
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0.0002773 0.0002768 0.0002773
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Figure D1. (Sheet 4 of 7)

```
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```

Figure D1. (Sheet 5 of 7)

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```

Figure D1. (Sheet 6 of 7)

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```

Figure D1. (Sheet 7 of 7)

Appendix E
Notation

Text	Appendix C	
	datetime	Ten-character string that contains date and time
	dbar	Mean water depth
	dmax	Maximum segment-averaged water depth in a collection
	dmin	Minimum segment-averaged water depth in a collection
df	delfs	Frequency increment
	d8b	Vector-averaged mean wind direction at secondary pier-end anemometer
	d8s	Measure of variability of wind direction at secondary pier-end anemometer
	d9b	Vector-averaged mean wind direction at primary pier-end anemometer
	d9s	Measure of variability of wind direction at primary pier-end anemometer
$d\theta$	odelang	Direction increment
$D(f_n,\theta_m)$		Directional distribution function at frequency f_n and direction θ_m
E_i		Incident wave energy
E_r		Reflected wave energy

Text	Appendix C	
f		Frequency
f_n		n^{th} frequency of a set of N discrete frequencies
f_p		Peak frequency
	fp	Frequency at peak of frequency spectrum
$f_{p,FD}$		Frequency at peak of frequency-direction spectrum
$f_{p,IFS}$		Frequency at peak of integrated frequency spectrum
g		Gravitational acceleration
$hhmm$		Mnemonic for time of day
H_{mo}	Hmo	Characteristic wave height
$H_{mo,i}$		Characteristic incident wave height
$H_{mo,r}$		Characteristic reflected wave height
	idgfr	Degrees of freedom in cross-spectral estimation
	ifdtrnd	Flag indicating whether or not data have been detrended
	ifimle	Flag indicating if maximum likelihood or iterative maximum likelihood estimation is used
	ifwindo	Flag indicating whether or not data segments have been windowed
	istot	Total number of seconds duration of a time series
	itero(nof)	Number of iterative maximum likelihood iterations used to compute directional distribution at frequency of(nof)
$I(f_n,\theta_j)$		Cumulative distribution function at frequency f_n and direction θ_j

E2

Appendix E Notation

Text	Appendix C	
j		Index associated with discrete direction
m	noa	Index associated with discrete direction
M	noang	Integer number of discrete directions
n	nof	Index associated with discrete frequency
	nband	Number of frequency bands averaged in spectral estimation
	nensb	Number of segments into which a data record is divided during spectral estimation
	nfft	Number of data points in a data segment
N	nofrq	Integer number of discrete frequencies
	oangle(noa)	Element noa of an array that represents direction coordinates
	of(nof)	Element nof of an array that represents frequency
	ogpat(nof)	Element nof of an array of 16-character strings that represent the working gauge pattern
	osf(nof)	Element nof of an array that represents the frequency spectrum
	ospc(nof,noa)	Array element representing the directional distribution function at frequency of(nof) and direction oangle(noa)
	rname	Four-character string denoting reference gauge
	sfrq	Sampling frequency
	s8b	Mean wind speed at secondary pier-end anemometer
	s8m	Maximum wind speed at secondary pier-end anemometer
	s8s	Standard deviation of wind speed at secondary pier-end anemometer

Text	Appendix C	
	s9b	Mean wind speed at primary pier-end anemometer
	s9m	Maximum wind speed at primary pier-end anemometer
	s9s	Standard deviation of wind speed at primary pier-end anemometer
$S(f)$		Frequency spectrum
$S(f_n)$		Integrated frequency spectral density at frequency f_n
$S(\theta_m)$		Integrated direction spectral density at direction θ_m
$S(f_n, \theta_m)$		Frequency-direction spectral density at frequency f_n and direction θ_m
$S_{min}(f_n)$		Minimum of $S(f_n, \theta_m)$ at frequency f_n
	thp	Peak direction of directional distribution at frequency fp
T_p		Spectral peak period
$T_{p,FD}$		Spectral peak period from the frequency at which the frequency-direction spectrum is a maximum
$T_{p,IFS}$		Peak period from the integrated frequency spectrum
w_m		m^{th} of a set of M weights used in the computation of incident and reflected energy
yymmdd		Mnemonic for date
$\Delta\theta$		Directional spread parameter
$\Delta\theta_n$		Directional spread parameter of a 180-deg directional distribution at frequency f_n

$\Delta\theta_{FDP}$	Directional spread parameter of the directional distribution at the peak frequency of a frequency-direction spectrum
$\Delta\theta_{IDS}$	Directional spread parameter of integrated direction spectrum
$\Delta\theta_{SW}$	Spectrally weighted directional spread parameter
θ_j	j^{th} direction of a set of M discrete directions
θ_m	m^{th} direction of a set of M discrete directions
θ_p	Peak direction
$\theta_{p,n}$	Direction of peak in directional distribution function at frequency f_n
$\theta_{p,FD}$	Direction at peak of frequency-direction spectrum
$\theta_{p,IDS}$	Direction at peak of integrated direction spectrum
$\theta_{p,SW}$	Spectrally weighted peak direction
$\theta_{25\%,n}$	Direction at which cumulative distribution function equals 0.25 at frequency f_n
$\theta_{50\%,n}$	Direction at which cumulative distribution function equals 0.50 at frequency f_n
$\theta_{75\%,n}$	Direction at which cumulative distribution function equals 0.75 at frequency f_n
ρ	Water density
χ	Reflection coefficient

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13. ABSTRACT (Maximum 200 words)

This report indexes parameters of and describes a means of access to 2,812 wind wave frequency-direction spectral observations obtained at the U.S. Army Engineer Waterways Experiment Station Field Research Facility from September 1995 to August 1996. An iterative maximum likelihood algorithm is used to estimate directional spectra using signals from a spatial array of 15 bottom-mounted pressure sensors in about 8 m of water, approximately 900 m offshore. Parameters include characteristic wave height, spectral peak frequency and corresponding peak period, peak wave direction, directional spread, and reflection coefficient. Time series graphs of these parameters, as well as local winds, illustrate the salient climatology.

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